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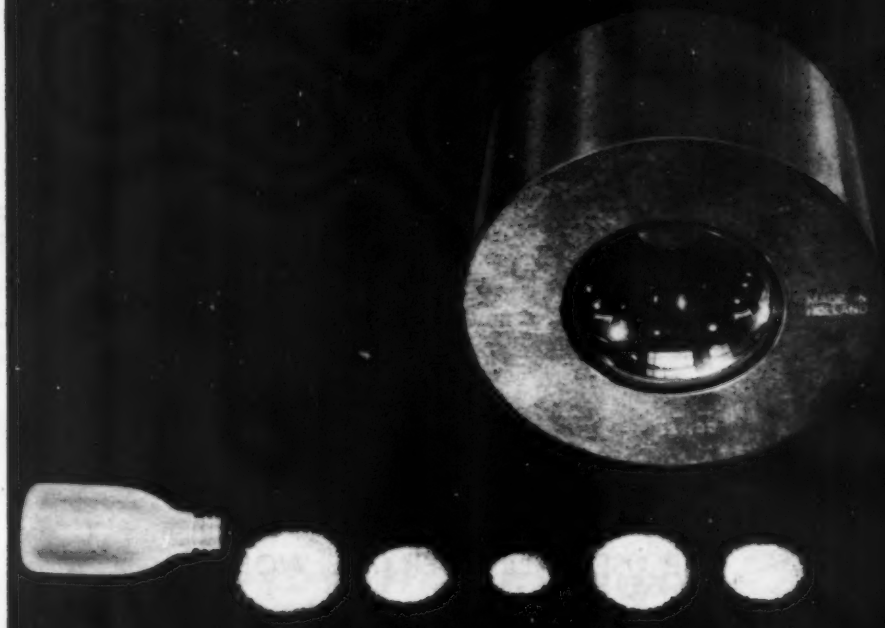

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Generally Speaking

New Look

With our January issue, we shall be appearing in a different style, and we would like to give our readers and advertisers some advance information about the changes that will take place then.

In the first place the size of the Review and Abstracts will be altered to conform to the International A4 paper size. This is a little larger than the present form, and will give us the opportunity of setting out the contents more conveniently and more attractively.

In addition, the Review is to be completely re-designed and will carry a cover picture (related to one of the articles) in full colour.

The advertising, which we hope will increase, will be restricted, in accordance with the principles laid down by the British Standards Institution for technical publications, to pages before and after the editorial matter, and will not as hitherto, be carried on pages in the body of the journal.

Simultaneously, the Abstracts will be re-designed also, with a view to making reference to them easier and to improving their appearance.

These changes will necessitate some alteration in the charges, both for the journals and for advertising, but we hope and expect that it will be generally felt that the improvements in style, and the corresponding improvement in contents and increase in circulation make these increases well worth while.

The details of the changes in price will be notified to our readers in the next issue, and the changes in advertising rates to our present advertisers by direct communication. Existing subscriptions will, of course, be fully valid until they expire.

We hope by these changes to be able to continue and to improve the service that the Review and the Abstracts have given to the Industrial Diamond industry, and to users of Industrial Diamonds in the past.

ADAMANT.

Off-Shore Diamond Drilling for the N.C.B.

By Our Northern Correspondent

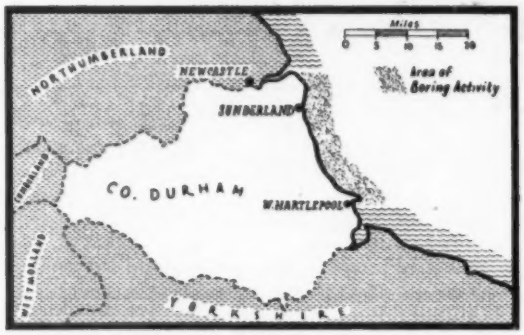

Fig. 1. Map showing the area off the coast of Durham in which diamond drilling is being carried out.

8 ft. coal seams under sea

An estimated 300,000,000 tons of workable undersea coal reserves have so far been established by the N.C.B. Durham Division's diamond drilling programme off the coast of Durham (Fig 1). Ten of the scheduled 15 boreholes have already been sunk and, despite delays caused by bad weather, progress has been maintained at a rate comparable to that for a similar operation on land.

The depth of the bores sunk to date has varied between 1,600 and 2,600 ft., the deeper holes generally being located in the central and southern parts of the prospecting region owing to the greater thickness of the Permian layer in that area. The thickness of workable seams so far discovered varies from 2 ft. 6 in. to 8 feet.

Cheaper and faster than estimated

Although diamond drilling into the seabed from an off-shore tower was first tried in the Firth of Forth in 1955, opinion in 1956 still tended to regard this form of exploration as being merely complementary to undersea drivages from existing workings which, it was thought, would continue to provide the principle means of exploration. At that time, too, it was considered that the sinking of a 3,000 ft. borehole would cost £100,000 and take about a year to complete.

Despite these calculations, a second and larger tower was constructed for diamond drilling operations off the coast of Durham, and the results so far achieved have shown that drilling can be carried out both faster and at a much lower cost than had been anticipated. The drilling rate has, in fact, averaged as high as 38 ft. 6 in. a day throughout a whole month.

Construction of the tower

Drilling is performed from a 170 ft. tower (Fig 2 and 3) built on to a cruciform box girder base which rests on the seabed. Stability during the boring operation is ensured by flooding the four arms of the cruciform. The tower can be raised for towing to a fresh site by expelling the water from the cruciform arms and raising the whole structure by means of electric winches mounted on two pontoons.

Attached to the 83 ft. 6 in. arms are the four legs of the tower which, at their base connexion, are 80 ft. square in plan. These incline inwards until, at a height of 60 ft., they are connected to the 40 ft. square vertical section of the tower.

Fig. 2. The drilling tower in position, as seen from the N.C.B.'s converted trawler supply vessel "Beechgrove".

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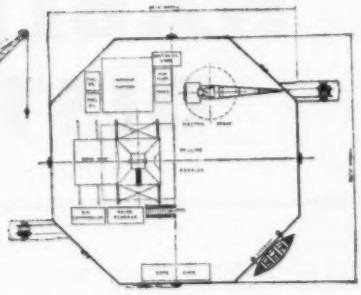


Fig. 3 b. Drilling platform.

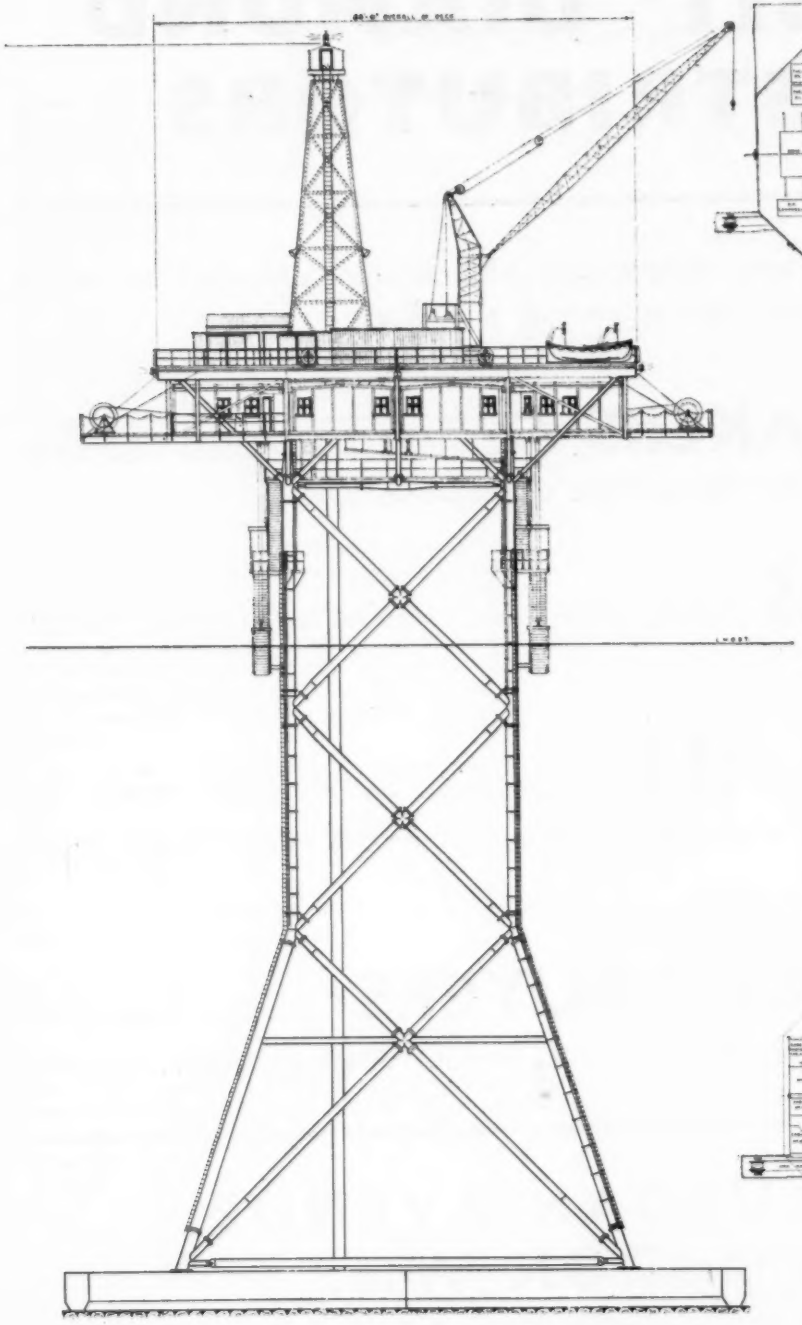
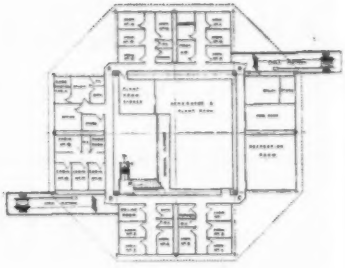
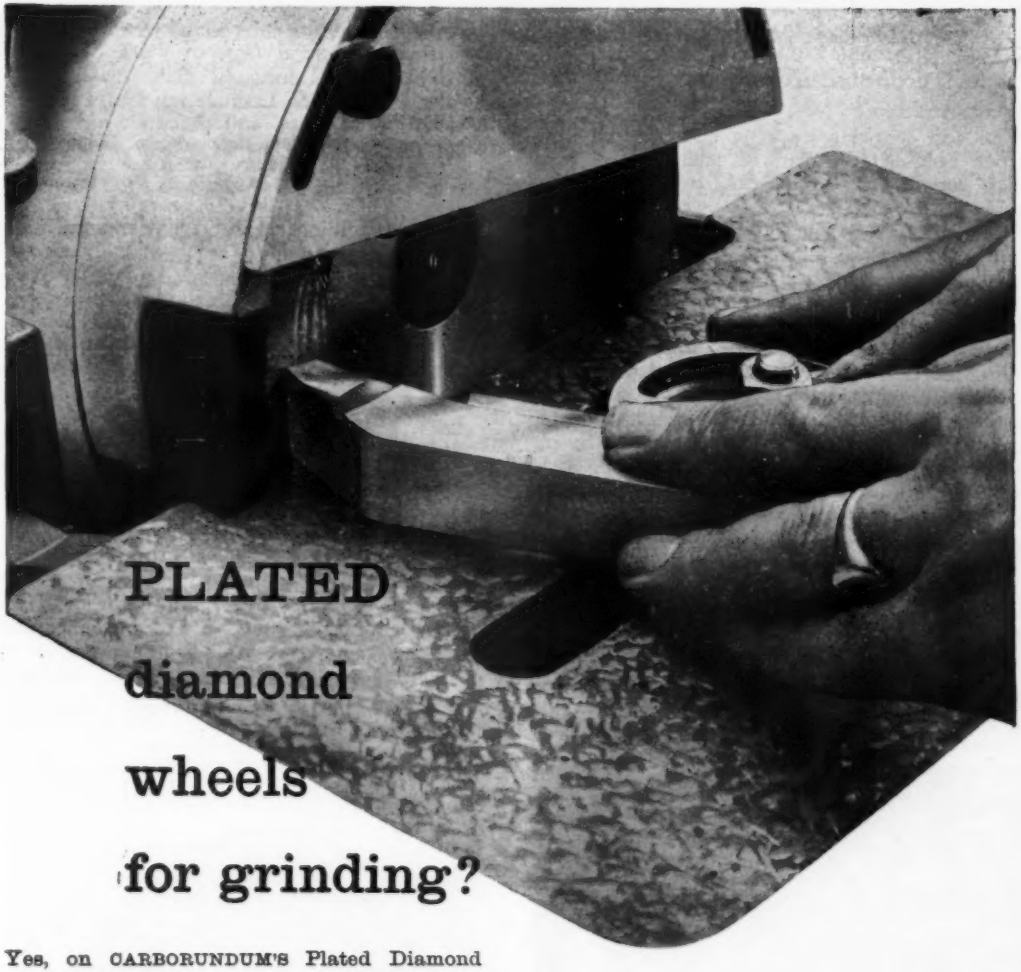


Fig. 3. Diagram of the tower, showing the cruciform base which rests on the seabed.

Fig. 3b. Accommodation. and plant deck.





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This section is 80 ft. tall and supports the superstructure from which the diamond drilling programme is controlled and operated.

The superstructure

The top working deck is constructed from timber bolted to a grid of rolled steel joists which are in turn connected to the vertical framework. There is a total working area of 680 sq. yds., about two-thirds of which is clear for use as working space for stacking drilling rods and borehole casings. The remaining area is occupied by housing for drilling equipment, water and fuel storage, mud-flush tanks, core shed, compressor, crane, and the 60 ft. drilling derrick. Below this is the accommodation deck with separate cabins for the boremaster and 19 men, bath and shower facilities, recreation room, mess, kitchen, first-aid room, launderette, and other amenities. Also at accommodation deck level are the generators, distillation units, rotary converter, and a workshop with space for storing the diamond crowns.

The drilling derrick is positioned about 10 ft. from the tower axis, and a 24 in. guide tube (Fig 4), firmly braced to the tower, extends down through the stem of the tower and into the seabed to a depth of around 12 feet.

The tower was designed by Posford, Pavey & Partners, consulting civil engineers, who had experienced a similar type of work during the war when they designed flak towers. The Cleveland Bridge & Engineering Co. Ltd. were the main contractors, and the diamond drilling programme is being carried out by Foraky Ltd., of Nottingham.

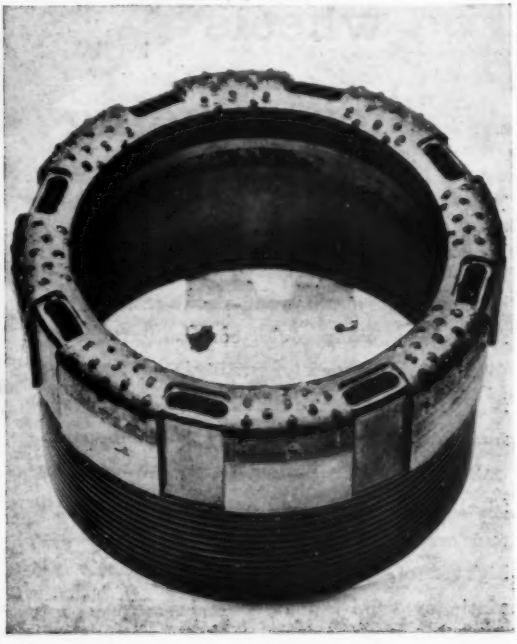
Diamond drilling procedure

Once the drilling rig is on site and the guide tube set into the seabed, the next step is to set in 12 in. casing to rock-head so as to exclude unconsolidated deposits. In the case of borehole No. 10, the latest to be sunk, 18 in. rock bits were used to drill to rock-head which was encountered after about 50 feet. When setting in the 12 in. casing, it is plugged with cement for several feet above the casing shoe and, when this has set, the plug is cored through and drilling is resumed with a 10 $\frac{5}{8}$ in. rock bit. At this stage, sample cores are taken at approximately 50 ft. intervals with an 8 in. diamond core drill.

When the cores show that the yellow sand which overlies the coal measures has been reached, drilling switches to an 8 in. double barrel diamond crown and continues until the junction of the yellow sand and the coal measures is reached. The 8 in. hole is then opened up with a 10 $\frac{5}{8}$ in. rock bit and 9$\frac{1}{4}$ in. casing is

Fig. 4. The 24 in. diameter guide tube which passes through the stem of the tower and into the seabed.

Fig. 5. The 6 in. (155 × 119 mm.) diamond core drill used in the drilling programme; it is set with approximately 100 ct. of ¼ ct. diamonds.



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cemented in. Coring then proceeds with 8 in., 7 in., and 6 in. diamond core drills to a depth of 1,000—1,500 ft. through the coal measures.

Owing to the expense and difficulty of maintaining a fresh-water supply for the drilling operation, the drilling mud used consists of sea-water and special additives devised by the Foraky Company.

Core recovery during drilling is of the order of 98-100%, and deflexion is kept well within 1°.

Diamond crown performance

The Diadril diamond crowns used throughout the N.C.B. off-shore drilling programme have been designed by Foraky Ltd. and manufactured by L. M. Van Moppes & Sons (Diamond Tools) Limited. All equipment used in the actual drilling operation is constructed to metric sizes, and Fig 5 shows the 155 x 199 mm. (approx 6 in. (core bit. This is set with around 100 ct. of $\frac{1}{2}$ ct. diamonds.

Both hand-set and machine-set diamond crowns have been used with the offshore rig, and experience has shown that whereas the machine-set crowns have a life of 800-900 ft., the average life of a hand-set diamond crown is 1,200 feet. It is not at present clear why this variation in the performance of the two types should be so great.

Acknowledgements

The Editor wishes to acknowledge the generous assistance of the following in the preparation of this article:

The National Coal Board ;

Foraky Ltd., drilling engineers ;

Posford, Pavey & Partners, consulting civil engineers ; and

L. M. Van Moppes & Sons (Diamond Tools) Limited.

Diamond Drilling for Durham University

Geological Background

Strata which produced the greatest wear on drilling diamonds ever experienced by the drilling contractors were encountered during diamond coring operations at Rookhope, West Durham. Conventional rock bits, used for open hole drilling, proved even more expensive.

Fig. 1. The drilling rig used during the sinking of the Rookhope borehole, West Durham.

The borehole, financed by the Department of Scientific and Industrial Research, was being sunk under the direction of Professor K. C. Dunham, head of Durham University's Geology Department, in an effort to determine the source of lead, zinc, flourine and barium minerals of the Pennine orefield.

The choice of the Rookhope site resulted from earlier studies by Professor Dunham in which he showed that the lead-zinc-fluorine-barium deposits, occurring as veins and replacements in the carboniferous rocks of the northern Pennines, exhibited a concentric pattern of regional mineral zones. This suggested that mineralization was due to heated solutions, rising at a limited number of centres, subsequently distributed laterally along channels conditioned by hard beds in the Yoredale sequence.

The results of a gravimetric survey of the region by Dr. M. H. P. Bott indicated the possible existence of a Permo-Carboniferous age granite underlying area, and it was suggested that this might not only have supplied the mineralization but that it might also have contributed to the devolatilization of the coal seams in the area. It was concluded that the depth of such granite would probably not be greater than 2,000 to 3,000 feet.

The Drilling Programme

Plans were made to sink a borehole to a depth of 5,000 ft if necessary at a point fixed by the geologists, and Foraky Ltd, of Nottingham, erected a 70 ft rig and started drilling in September, 1960. The rig employed standard Foraky 22 winch equipment and Foraky 275/20 pumps, the power for all equipment at the site being provided by Ruston diesel engines.

The first move was to set a 9¼ in. O.D. standpipe to a depth of 27 ft in unconsolidated limestone in preparation for the diamond drilling programme. Diamond coring started with 8 in. diamond crowns and the borehole was advanced to 841 ft with this diameter. Eight-inch casing was then set in, and coring proceeded with 7 in. diamond crowns. It was whilst the 7 in. coring was in progress that the diamonds first bit into granite. The depth of the borehole at that time was 1,280 feet.

The wear on the diamond crowns coring the granite formation eventually became so heavy that it was decided to reduce bore. A 'lost' column was therefore inserted at 1,635 ft, and coring resumed with 6 in. diamond crowns.

Occasionally the geologists authorised open hole drilling, and a total of 191 ft was drilled in this way, using Hughes WR7 Tricone rock bits The wear cost of these exceeded that of the diamond crowns, and additional experiments with the diamond-impregnated crown showed no appreciable reduction in cost. Diadril crowns were also tried without achieving any increase in performance.

Drilling eventually proceeded with the 6 in. diamond crowns to a depth of 2,650 ft, reached in July of this year, at which depth it was decided to discontinue drilling.

Core recovery throughout the operation was very satisfactory, varying between 90 and 98%.

Results

Core obtained during the drilling are currently being studied at the Department of Geology in Durham. It is intended eventually to lower a seismograph down the borehole at Rookhope in order to obtain accurate readings of earthquake waves.

The results achieved by the diamond crowns in the extremely hard strata encountered during drilling demonstrated their superiority over conventional bits in these conditions. Despite the high cost of wear on the crowns, they were considerably more economical than the rock bits used during part of the programme.

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Diamond Ground Ceramic Wafers Seal Tiny Electron Tubes

By Our United States Correspondent

At the Electron Tube Division of the Radio Corporation of America (RCA), diamond-impregnated grinding wheels are playing an important role in the precision production of components for miniature tubes.

RCA's nuvistor tube, which is their latest development in electron tubes, used in a wide variety of entertainment, industrial, and military electronic systems, is constructed entirely of strong metal and ceramic. The complete tube, however, weighs only one-fifteenth of an ounce (Fig. 1).

This ' new look ' in electron tubes, employing concentric cylinders supported in an open-ended cantilever construction, together with an ingenious combination of new materials, processes, and fabrication techniques, is a most important development in the receiving tube industry for size, performance, power drain, quality, and reliability.

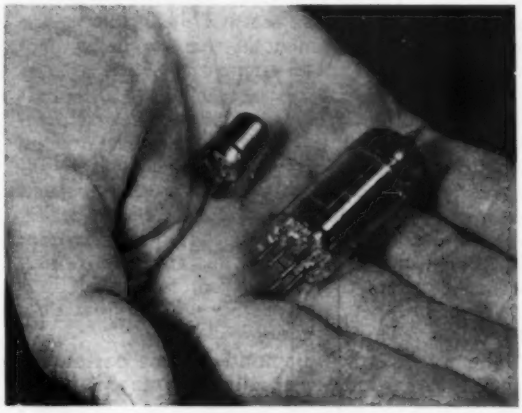

Fig. 1. R.C.As. nuvistor tube compared with a miniature valve.

For ruggedness, a strong ceramic base-wafer is used as a platform on which is erected an array of tube electrodes, each solidly held in place by a tripod-like structure (Fig. 2).

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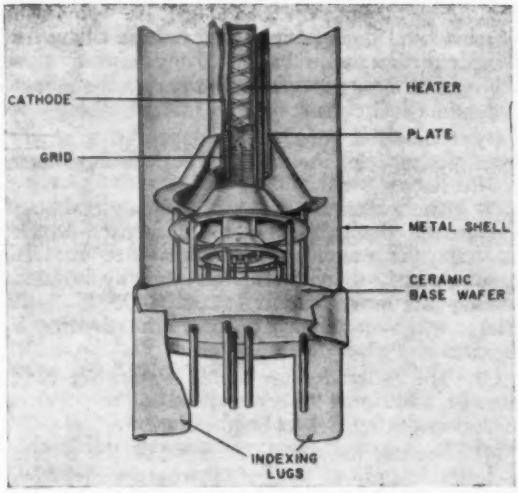


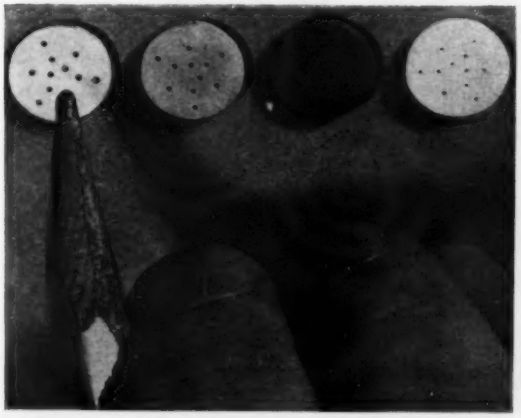
Fig. 2. The ceramic base-wafer used as a platform for tube electrodes.

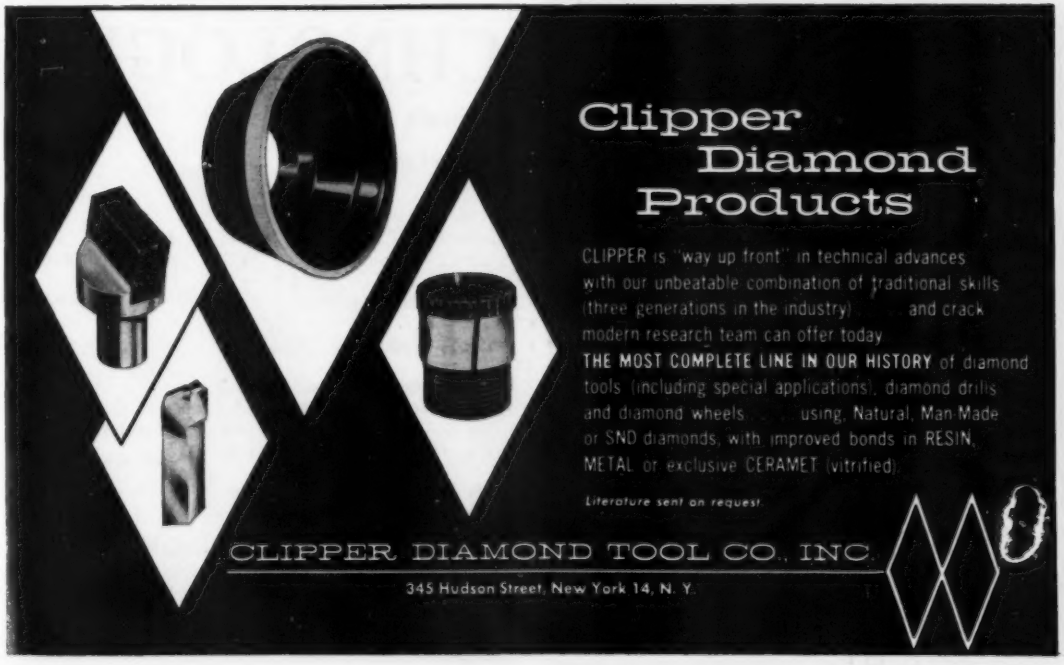
After the separate components of the nuvistor tube have been assembled and brazed, the unit is processed at high temperature in a vacuum exhaust furnace. The ' gettering ' is carried out on the tubes at very high temperatures to eliminate the gases and activate the cathode. The tubes are sealed before they leave the vacuum furnace.

One of the outstanding accomplishments of the engineers at RCA was the development of the process needed to provide an airtight seal between the ceramic base-wafer of the nuvistor tube and the metal envelope that covers the unit.

The base-wafer, pressed of a forsterite ceramic, is 0.4 inch in diameter and 0.062 inch thick. There are 11 holes in the ceramic base-wafer for

Fig. 3. There are 11 holes in the ceramic base-wafer for wire leads.

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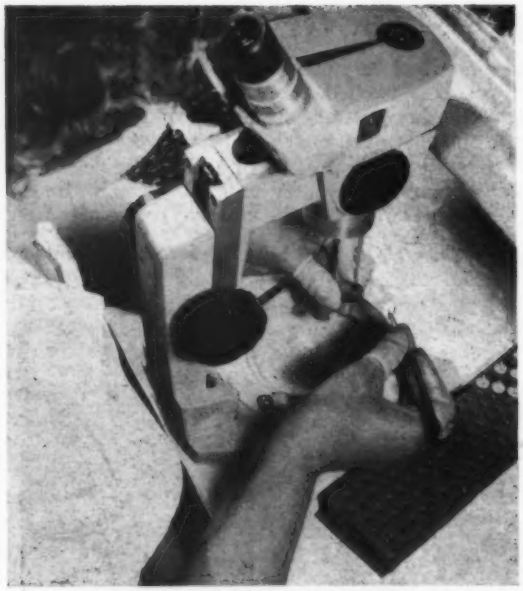

Fig. 4. Assembly tube components.

wire leads into the tube (Fig. 3). After the tube has been evacuated of gases airtight seals must be created between the circumference of the wafer and the metal envelope. The seal between each wire lead and its corresponding hole in the wafer is made during the previous brazing step.

Preparation of the ceramic wafers for the metal-to-ceramic seal consists of the following steps:

(1) The fired wafers are dipped in a newly developed special metallized solution and dried in a furnace.

(2) The wafers are then placed in a metal boat and passed through a hydrogen furnace which converts the metallizing solution into molybdenum metal. Each wafer has a firmly bonded coating of molybdenum, about 0.00025 inch thick, when it emerges from the hydrogen furnace.

(3) The molybdenum coated wafers are next given an additional flash metal coating to prevent oxidation during the sealing operation.

(4) Because the metallic coating on the wafers is desirable only at the points where a metal-to-ceramic seal is required (circumference of wafer and in lead-wire holes), each wafer is passed between two diamond wheels which simultaneously remove the molybdenum metal coating from the top and bottom surfaces of the wafers. The metallic coat is thus left intact at the sealing points. During assembly of the tube components (Fig. 4), copper brazing rings are installed at each wire lead. Brazing is done in a hydrogen atmos-

DIAMOND TECHNOLOGY

by Paul Grodzinski

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phere, forming the effective ceramic-to-metal seal at each of the 11 leads. The final seal is made in a vacuum, by means of a germanium-copper brazing ring between the circumference of the ceramic base wafer and the metal shell.

The production of nuvistor tubes has been greatly improved by diamond grinding of the ceramic wafers. Originally, the metal-coated wafers were mounted on pallets and ground with abrasive belts. It was then necessary to remove the wafers from the pallet and remount them to grind the other side. This procedure was not satisfactory to RCA production men because of the time consumed and the non-uniform results obtained due to variations in belt pressure on the wafers.

A Besley grinder, equipped with two diamond wheels, is now employed. The two wheels, driven by separate motors, turn in opposite directions at 1760 rpm.

Plastic holders, travelling in circular paths, carry the wafers between the two wheels while the metal coating is ground off both surfaces. The 12-inch metal wheels, have a one-and-one half inch wide grinding face impregnated with small block-shaped particles of natural diamond. The arc of the circle travelled by the plastic holders carries each wafer across the entire width of the diamond-impregnated face of the grinding wheels.

The two wheels are slightly tilted so that the gap between them is 0.069 inch where the wafers enter, and 0.060 inch where the wafers exit. The tilted wheels remove about 0.003 inch of stock from each side of wafers.

Fig. 5. Grinding the wafers.

The angle Besley grinding machine, which can finish about 2000 wafers an hour, provides enough production for the large volume of nuvistor tubes now being assembled. The diamond wheels have been in use at RCA since August, 1960, and have ground over 1,000,000 of the ceramic wafers. The expected useful life of these wheels, based on measurable rate of wear, is about 5,000,000 wafers.

News from Abroad

The Mineral Development Corporation, of India, has prepared two project reports for the exploitation of the diamond deposits of the Majhgawan and Ramkherya areas in the Panna district of Madhya Pradesh.

The Majhgawan scheme will cost an estimated £675,000, with a foreign exchange component of £195,000. The annual production of diamonds is estimated at 30.000 ratties.

The Ramkherya project is estimated to cost £345,000, with a foreign exchange component of £155,925, and the annual output of stones will be an estimated 12,500 ratties.

Ukrainian experts have worked out for the first time in the USSR, the technology of the experimental industrial manufacture of artificial diamonds.

Two thousand carats of artificial diamonds were produced on the occasion of the 22nd Congress of the C.P.S.U., and the plan for 1961 has been overfulfilled four-fold.

The artificial stones were manufactured at the Ukrainian research institute of synthetic super-hard materials and instruments.

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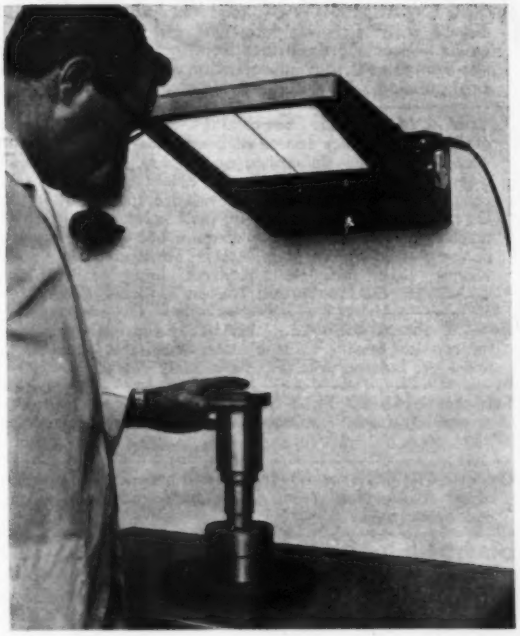

other vertical surface when tall objects have to be examined (See illustration).

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INDUSTRIAL DIAMOND ABSTRACTS

Industrial Diamond Information Bureau,
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1961 Volume 18
NOVEMBER

DIAMOND MINING AND INDUSTRY

Israel : Inquiry into the diamond industry. Israël : Enquete in de Diamantnijverheid

Anon. *Belg Diamantnijverheid* 1961 Vol 43 (9) p 7 (Sep) (In Flemish)

Israel's diamond industry, in which 6,000 workers are employed, is second only to Belgium's in the world. Figures are given. *B* *F.25.351*

Tanganyika diamond exports for June

Anon. *Diamond News* 1961 Vol 24 (11) p 18 (Aug)

Figures are given for June 1961, and the period Jan-June 1961, and compared to June 1960, and Jan-June 1960. *B* *F.251.364*

Diamonds : nationalisation of the industry in Ghana. Diamante : Nazionalizzazione dell'industria nel Ghana

Anon. *Industr Min Ital* 1961 Vol 12 Ser II (8) p 523 (Aug) (In Italian)

85-90% of the 3,130,000 ct mined in Ghana are industrials. It is stated that one of the main objects of the state is to combat diamond smuggling.
M *F.25.367*

Diamonds worth over R 170,000 found in new Windsorton breakwater

Anon. *Diamond News* 1961 Vol 24 (11) p 9 (Aug)

The alluvial diamond diggings have been given a 'shot in the arm' by a rich 'strike' at the new breakwater at Windsorton, which has already yielded over £85,000 (R 170,000) worth of diamonds. 1 illustr.
B *Ebeb.12.361*

Alluvial Diamonds—June 1961

Anon. *S Afr Min Engng J* 1961 Vol 72 Pt 2 (3577) p 483 (Aug 25)

Production figures are given for industrial mines and for the whole province in Transvaal and Cape Province, and also for Private Estates.
B *Ebe F.12.361*

South African Mineral Output (June 1961)

Anon. *Min Mag, Lond* 1961 Vol 105 (3) p 179 (Sep)

Production figures for diamonds in June 1961 are given. *B* *F.13.361*

[Diamonds in the Republic of Cameroun]

Anon. *Miner Tr Notes* 1961 Vol 53 (3) p 16 (Sep)

Three diamonds, one weighing 1.7 cts, were discovered in the Mere and Vina regions during 1960. The Bureau de Recherches Géologiques et Minières was expected to intensify prospecting in the area in 1961.
B *F.12.366*

[News of the Angola Diamond Co]

Anon. *Min Mag, Lond* 1961 Vol 105 (3) p 134 (Sep)

Figures and other news of diamond production in Angola are given, including mention of new diamondiferous deposits discovered on the eastern bank of the R. Chicapa, estimated to contain about 90,000 cts in gravel yielding, on average, 0.70 cts/cu metre.
B *Eb.12.3676*

Sierra Leone Government Diamond Buying Office

Anon. *Gemmologist* 1961 Vol 30 (362) p 174 (Sep)

The Diamond Buying Office, which was set up to persuade diggers to sell their stones legally, instead of to smugglers, exceeded in the month of June the last year's June figure by a substantial margin. Figures are given. *B* *F.251.3672*

Accra diamond market

Anon. *Min J* 1961 Vol 257 (6581) p 349 (Oct 6)

The eight companies operating on the Accra diamond market in Ghana have agreed to pay 1% commission, it is stated, to the Diamond Workers Co-operative Union for handling their members' diamonds. The money will be used to improve the methods and yields of member firms. The effects of this decision are outlined. *D* *F.251.367*

History of the diamond—5 : Original favourite was pearl not diamond

S. Tolansky. *Diamond News* 1961 Vol 24 (11) pp 11-12 (Aug)
B *F.28*

Symposium : Modern practices in diamond mining in Southern Africa

The South African Institute of Mining and Metallurgy, Johannesburg 1961, 198 pp ; *IMM Abstr* 1961 Vol 11 (6) p 188 (Aug-Sep)
B *F Hd.361*

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Consideration of the recent evolution of the Israeli diamond industry. Bespiegelingen over de jongste evolutie van de Israëlische Diamantnijverheid

Anon. *Belg Diamantnijverheid* 1961 Vol 43 (9) p 2 (Sep) (In Flemish)

2 ref. *B* *F.25.351*

Basutoland ban on diamond diggings

Anon. *Diamond News* 1961 Vol 23 (11) p 24-25 (Aug)

B *F.25.361*

Russian diamonds in Britain

Anon. *Diamond News* 1961 Vol 24 (11) p 22 (Aug)

The *Financial Times* reports that among Russian goods bought by British concerns are diamonds, both gem and industrial, which have been bought by the Diamond Corporation under an agreement with the Russians. *B* *F.33:.251.321*

Diamond production : Congo diamonds : Tanganyika : South Africa. Diamantvoorbrengst : Kongo Diamant : Tanganyika : Zuid-Afrika

Anon. *Belg Diamantnijverheid* 1961 Vol 43 (9) p 6 (Sep) (In Flemish)

Production figures are given.

B *F.25.361/F.25.364/F.25.365*

[Israel's diamond industry]

Anon. *Gemmologist* 1961 Vol 30 (362) p 180 (Sep)

Figures are given of Israel's export of polished diamonds to various countries, and of the sales of rough diamonds to Israel by the Diamond Trading Co, London. The increase in factories, number of employees *etc*, is also reviewed.

B *F.25.351*

Brazil's diamond hopes

Anon. *Diamond News* 1961 Vol 24 (11) p 27 (Aug)

The Pato Consolidated Gold Dredging of Montreal is test-pitting and drilling two diamond bearing areas in Brazil and hopes to outline their potential by the end of 1961, according to its president. The work is being carried on by Explorasao de Minerios, Brasilia.

B *Eb.12.346*

[Diamond rush in Basutoland]

Anon. *Gemmologist* 1961 Vol 30 (362) p 174 (Sep)

Diamond speculators have been busy in Basutoland where there was recently a rush to peg down claims at Letsa-La Drai in the rugged mountain area of Basutoland. *B* *F.12.361*

Under-sea diamond mining project

Anon. *Diamant* 1961 Vol 4 (33) pp 21-22 (Aug); (In English, French and Flemish); *Evening Standard* 1961 (42,653) p 3 (Aug 3); *Diamond News* 1961 Vol 24 (11) pp 19-20 (Aug)

Two Americans, S. Collins and E. Kailey, will shortly start looking for diamonds on the sea bed in the southern part of the Atlantic Ocean. They head a diamond mining concern, that obtained a concession by the South African Government to explore a three miles wide strip off the coast of the trust territory of South West Africa from Oranjemund to Luderitz Bay, covering 176 miles of coastline.

B *Bnt Cfb Nh*

European diamonds

V. O. Ruzhitskii. *Priroda* 1960 Vol 49 (11) pp 27-34 (Nov); *Library of Congress Mthly Index Russ Access* 1961 Vol 13 (11) p 3447 (Feb) (In Russian)

D *Eb.32*

The diamond industry in the USSR

G. A. Vvedenskii *Vest Inst po Izuch SSSR* 1960 (1) pp 38-50 (Jan-Mar) (In Russian)

The author acknowledges the vital part that industrial diamonds play in modern technological processes, and considers that the society which can develop its industry fastest will win the competition between the capitalist and socialist systems. The superior strategic position of the USSR, possessing its own deposits, is noted. The substitution of other hard materials for diamond is not practicable, and is in some cases impossible, according to American specialist opinion. In another reference to the importance of industrial diamonds, the industrial potential of the USA would, according to a direct quotation from the US journal *Steel*, be lowered by a half if these supplies were halted. The USSR was forced to create its own diamond industry, the author states, because of the obstruction of the capitalist markets. At the end of the current seven year plan in 1965 the USSR will need 9 million cts of diamonds *p a*, when 90-91 million tons of steel will be produced. Were it not for the fact that the Yakutian deposits are so remotely situated, making all year round working impossible, production could be raised to 20 million cts *p a* by 1965; if it is felt to be necessary this figure could, it is claimed, be easily attained. However, with satisfactory progress at the end of 1960, the target of 9 million cts *p a* by 1965 appears to be both feasible and to satisfy current economic policy. 43 ref.

See also Diamond Mining in the USSR, *Industr Diam Abstr* 1961 Vol 18 p A2 (Jan).

D *Eb.12.332/Fc.25.33*

Diamond fever—Part 3—Return to British Guiana

W. Greatorex. *Gemmologist* 1961 Vol 30 (362) pp 175-180 (Sep)

1 illustr, to be cont. *B* *F.3474*

On the presence of kimberlites in the western part of the French Sudan

L. Marvier. *Asociacion de Servicios Geologicos Africanos* (20th Int geol Congr, Mexico 1956) Mexico 1959 pp 437-441; *IMM Abstr* 1961 Vol 11 (6) p 174 (Aug-Sep) (Original in French)

B *Ebb.12.368*

The Bakwange (Ex-Belgian Congo) kimberlites

C. Meyer de Stadelhofen. *Chron Mines Rech min, Paris* 1961 pp 17-18 (Apr); *IMM Abstr* 1961 Vol 11 (6) p 181 (Aug-Sep) (Original in French)

A detailed study of the kimberlites will be published. The author, (Geophys Lab of Lausanne Univ (Switzerland)) has made his conclusions available for pre-publication. *B* *Ebb.365:.21*

The mineral resources of Southern Rhodesia

R. B. Anderson. *7th Commonwealth Min Metall Congress, S Rhodesia Section* 1961 pp 24-91; *IMM Abstr* 1961 Vol 11 (6) p 174 (Aug-Sep)

The author reviews the ancient mineral industry of the colony, including the deposits and mines of gemstones. *B* *Bb Cb.363*

Angola, unknown Africa

V. Wentzel. *Nat geogr Mag* 1961 Vol 120 (3) pp 347-383 (Sep)

In an article describing a 6,000 mile journey through Angola, the author describes the headquarters of the 'Companhia de Diamantes de Angola' at Dundo, and the diamond operations he was allowed to witness. Numerous illustrations. *B* *Hd.3676*

Experimental determination of the minimum volume of a sample taken from diamond-bearing kimberlites

IU. F. Gritsenko. *Razved i okh nedr* 1960 Vol 26 (10) pp 5-15 (Oct); *Library of Congress Mthly Index Russ Access* 1961 Vol 13 (11) p 3447 (Feb) (In Russian)

D *Ebb.332*

Folklore and history of diamond : Part 2—Cleavage and polishing

S. Tolansky. *Gemmologist* 1961 Vol 30 (362) pp 167-170 (Sep)

2 illustr, to be cont. *B* *F.28*

Paleozoic kimberlites of the Siberian platform

V. S. Trofimov. *Dokl An SSSR* 1960 Vol 135 (4) pp 940-943; *Library of Congress Mthly Index Russ Access* 1961 Vol 13 (11) p 3629 (Feb) (In Russian)

D *Ebb.332*

Some data on diamonds found in the form of polycrystalline aggregates

IA. M. Kravtsov, S. I. Futergendler. *Zap Vses min ob-va* 1960 Vol 89 (4) pp 464-466; *Library of Congress Mthly Index Russ Access* 1961 Vol 13 (11) p 3447 (Feb) (In Russian)

D *F Ubfz*

Concentration of diamonds

Denver Equipment Co. *Min J* 1961 Vol 257 (6580) p 319 (Sep 29)

A bulletin issued recently, No M7F74, deals with diamond recovery both from alluvials and kimberlite. The use of heavy media, both for dealing with coarse material as well as a somewhat finer size range in cyclones, is discussed as well as reconcentration using attrition grinding and screening, grease belt and electrostatic precipitation. *D* *F Hf*

PHYSICAL, CHEMICAL, & MECHANICAL PROPERTIES OF DIAMOND

Synthetic diamond. Synthetisch diamant

Anon. *ADB Maandelijks* 1961 (324) p 6 (Aug) (In Flemish)

B *Fh.21*

GJ's quick course in gemmology, Part 6 — Testing by transparency

Anon. *Goldsm J* 1961 Vol 67 (512) pp 446-447 (Oct)

The terms transparency, translucency and opacity are defined with regard to gemstones. The only real test for diamond is by X-ray, it is stated, as only diamond is completely transparent to this form of 'light', or radiation. 3 illustr. *D* *Bb Ukc/F Ukc*

Manufacture of synthetic diamond. Vervaardiging van synthetische diamant

Anon. *Belg Diamantnijverheid* 1961 Vol 43 (9) p 13 (Sep) (In Flemish)

Description of the GEC method of production of synthetic diamond. *B* *Fh Qc*

Diamonds by shock wave

Anon. *New Sci* 1961 Vol 11 (253) p 725 (Sep 21)

At the Stanford Research Institute, Calif, pressures from explosions are being used to make diamonds. A quantity of graphite placed over a container of water, is subjected to shock wave pressure of about 300,000 atms from an explosive charge fired above, and, when recovered from the water, the material has been found to contain tiny diamonds, up to 40 μ in diameter.

B *Fh Ha*

Calculation of the internal field in NaCl and diamond type crystals

Z. A. Demidenko. *Sov Phys, Solid State* 1961 Vol 3 (3) pp 585-591 (Sep) (Original in Russian)

The analytic function w (k) for symmetrical directions of the wave vector may be found in these crystals by a formula which is obtained for certain lattice sums. 5 tables, 6 ref. *D* *Bdf Ub*

Inclusions in diamond II. Einschlüsse im Diamant II

W. F. Eppler. *Dtsch Goldschmiede-Ztg* 1961 Vol 59 (9) pp 543, 547 (Sep) (In German)

B *F Gk*

Synthesis of diamonds

A. V. Nemilova. *Zap Vses min ob-va* 1960 Vol 89 (4) pp 453-455; *Library of Congress Mthly Index Russ Access* 1961 Vol 13 (11) p 3447 (Feb) (In Russian)

D *Fh Ha*

High pressure research at the National Engineering Laboratory

H. Ll. D. Pugh, J. Lees, K. Ashcroft, D. A. Gunn. *Engr, Lond* 1961 Vol 212 (5508) pp 258-262 (Aug 18)

The work of the Lab is stated to fall into three categories, namely, the effect of high pressure on the mechanical properties of materials; the use of high pressures in the forming of materials, and the combination of ultra-high pressures and high temperatures in the synthesis of new materials. The equipment used in these studies and the selection of a suitably strong material for the construction of the apparatus are described. Diamond has been successfully synthesized with this apparatus using a sandwich of alternate graphite and nickel with tantalum end tabs at a pressure of 75,000 atms, and a temperature of 2,000° Kelvin. The largest diamond produced was 0.3 × 0.3 × 0.4 mm, and some of its physical properties are described, but it is stated that a great deal has to be learned about synthesizing diamonds of sufficient size and quality. Diamond synthesis was a necessary preliminary in the Lab's research programme, it is stated. 13 illustr.

D *Fh Ha.131.321*

Long-range forces and the dynamical equations for homopolar crystals of the diamond type

K. B. To'pygo. *Sov-Phys, Solid State* 1961 Vol 3 (3) pp 685-693 (Sep) (Original in Russian)

17 ref. *D* *Bdf Ub*

X-ray diffraction spikes of diamond

Y. Yoneda. *Nature, Lond* 1961 Vol 191 (4794) pp 1187-1188 (Sep 16)

The anomalous X-ray reflexions of diffraction spikes from type I diamonds have been studied by a number of authors since their discovery. The author of the present article discusses and evaluates the theories of others, and sets forth his own ideas. 7 ref.

B *F Uklb*

Manufacture of synthetic diamonds

M. N. Godlevskii. *Geol Rud Mestorozh* 1960 (5) pp 125-128 (Sep-Oct) (In Russian)

This is a general survey of the progress made in diamond synthesis up to 1960. 12 ref, 4 illustr.

See also *Industr Diam Abstr* 1961 Vol 18 p A97 (Apr).

D *Fh Ha*

Meteoritic diamonds by shock waves ?

M. E. Lipschutz, E. Anders. *Giochimica et Cosmochimica Acta* Vol 24 p 83 ; *New Sci* 1961 Vol 11 (251) p 600 (Sep 7)

A report of further studies to determine how diamond was formed in meteorites indicates that cohenite (Fe_3C) rather than graphite may be the substance from which diamond was formed. The conditions necessary for diamond formation have yet to be agreed upon, but, if the above is true, the conditions are then said to be severely limited. *D* *Ebb Hb.12*

Oriented growings of olivine, garnet and chromespinellide in diamonds

S. I. Futerhendler, V. A. Frank-Komenetzky. *Zap Vses Mineralog Obshch* 1961 Vol 90 (2) pp 230-236 (Jan-Feb) (In Russian)

The studies were carried out by X-ray analysis. The authors conclude that the study of diamond and the minerals occurring with diamond is of interest in the general question of the genesis of diamond. 5 ref.

D *F Ha.21*

Habit of diamond crystals as a reflection of conditions of their formation

P. S. Vadilo. *Zap Vses Mineralog Obshch* 1961 Vol 90 (2) pp 237-241 (Jan-Feb) (In Russian)

4 illustr. *D* *F Hb Ub*

On the question of the genesis of minerals accompanying diamond in Yakutian kimberlites

I.P. Ilupin, I. T. Kozlov, A. A. Pankratov. *Zap Vses Mineralog Obshch* 1961 Vol 90 (4) pp 488-492 (July-Aug) (In Russian) ; *Zap Vses Mineralog Obshch* 1960 Vol 89 (4) pp 392-399 (July-Aug) (In Russian) 18 ref

The authors, members of the Amakin expedition conducted by the Yakutian geological directorate of the RSFSR chief geological department, add their observations to those set out in the article indicated above. 5 ref. *D* *F Ha:Ebb.332*

USP 2,960,909 (Jan 7, 1957) **R. M. Shipley jun.**

Method for determination of color of gems

The colour of cut diamonds, other gems, or other irregularly shaped, transparent or translucent substances is measured by passing a concentrated beam of light through the gem upon a light-sensitive cell and measuring the response of the cell on a standard microammeter. A filter (blue and yellow selectively) may be interposed to obtain different readings. The response to yellow (minus blue) is then divided by the response to blue light to produce a unitary figure for reading against a scale with relative values for the yellow content of the gem. A standard cell may be used to serve as a standard for comparison. 1 claim, 2 illustr. Ref cited : 2 USP ; 1 BP ; 2 FP ; 1 DBP ; 1 book.

J *Bb Ceb Ukb.545/F Hkb Ukb.545*

LITERATURE REQUESTS
When applying for the loan of literature abstracted in this journal, please quote the title of the article, the name of the author, and the number of the page on which it appeared.

USP 2,962,838 (May 20, 1957) **R. W. Kebler, E. E. Dutchess, R. L. Hutcheson, Union Carbide Corp**

Method for making synthetic unicrystalline bodies

There is a need for sapphire windows in photoconductive type detectors which have an aerodynamically streamlined shape and are mechanically strong. Verneuil type conventional boules have not been grown successfully in large enough diameters. By the Verneuil process synthetic sapphire, rutile, spinel are produced as boules in cylindrical form of usually not more than one inch diameter. Unicrystalline bodies cut from these boules do not exceed $\frac{1}{4}$ inch diameter. The problem of growing symmetrical concave-convex boules from which streamlined or hemisphere-shaped windows can be fabricated has been solved by accumulating and crystallizing the fused constituents on a crystal seed in rod form. The crystal seed is rotated about its longitudinal axis and disposed at an oblique angle to the axis or direction of the flame, so as to form a radially enlarged crystal of increasing diameter as molten material is dropped on it. 10 claims, 4 illustr. Ref cited : 3 USP.

J *Bbc Cs.1456.545*

FP 1,243,890 (Sep 9, 1959) **General Electric Co**

Method for converting carbonaceous material into diamond. Procédé pour convertir des matières carboneuses en diamant

It was assumed that there existed a line of thermodynamic pressure-temperature equilibrium between diamond and the other forms of carbon and that it was only necessary to subject carbon to a certain pressure at a certain temperature to produce the conversion of other forms of carbon into diamond. It was then found that this procedure was not sufficient but that catalysts are required which initiate the conversion in the theoretical region of the pressure-temperature diagram using a pressure of at least 75,000 atmospheres. Further researches have shown that certain alloys of at least two metals may lower the required pressure for conversion to 50,000 atm at about 1200° C. One of the metals should be of Group VIII of the periodic table or chromium, tantalum or manganese. The carbonaceous material to be converted may be graphite, the catalyst nickel alloyed with chromium, manganese, iron or copper. It may also be an iron-manganese alloy. The conversion should be carried out in an inert vessel. 9 claims, 1 illustr.

J *Fh Ha.545*

FP 1,243,889 (Sep 9, 1959) **General Electric Co**

Conversion of carbon into diamond. Conversion de carbone en diamant

Carbon and a catalyst are subjected to a pressure of at least 75,000 atm at a temp of 1200 to 2000° C. The carbon may be amorphous or in the form of graphite. as catalysts the following metals are mentioned : iron, Cobalt, nickel, rhodium, ruthenium, palladium, osmium, iridium, chromium, tantalum, manganese, or mixtures of these metals. It is preferable to have the pressure higher than 75,000 atm *ie* between 80,000 and 110,000. 6 claims, no illustr. *J* *Fh Ha.545*

FP 1,243,891 (Sep 9, 1959) **General Electric Co**

Method of converting carbonaceous materials into diamond. Procédé de conversion de matières carboneuses en diamant

This refers to the conversion of *eg* graphite into diamond at a pressure of at least 90,000 atm (up to 115,000 atm) at a temperature of 2050 to 2500° C in the presence of platinum. 1 claim, no illustr.

J *Fh Ha.545*

FP 1,243,888 (Sep 9, 1959) **General Electric Co**

Diamond synthesis. Synthèse du diamant

The method has been devised for the purpose of eliminating the necessity to determine the temp at which the conversion of another form of carbon into diamond takes place, and for indicating the moment at which the conversion occurs. A mixture of carbon other than diamond and a catalyst is subjected to temps and pressures sufficient for conversion (at least 75,000 atm and 1200 to 2000° C) until a more or less sharp bend occurs in the curve, representing the electrical resistance of the mixture as a function of the time of the process. Pressure and temp may then be automatically reduced. 4 claims, 1 illustr.

J *Fh Ha.545*

FP 1,243,976 J. F. H. Custers, H. B. Dyer, B. W. Senior, P. T. Wedepohl

(Nov 7, 1958 ; Oct 23, 1959—South Africa)

Diamond synthesis. Synthèse de diamants

It is assumed that diamond becomes a stable form of carbon only under certain conditions of temperature and pressure and that there is a line in the phase diagram of carbon representing the equilibrium between graphite and diamond shown in Fig 1 calculated from the formula (Bernard et Simon): Pressure (atm) = 7000 × 27 × temp abs (K). However, it has been found that it is not sufficient to create the right theoretical conditions of pressure and temperature, as the transition does not take place at measurable speeds. There exists an intermediate excited phase which cannot be passed by graphite or diamond because of an energy barrier at lower temperatures.

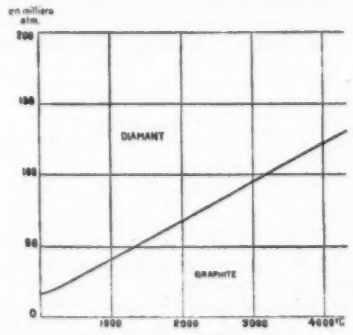


Fig 1. FP 1,243,976.

This intermediate phase has a specific volume considerably higher than that of graphite or diamond, so that pressure prevents the transformation by increasing the height of this energy barrier, whether the initial material is graphite or diamond. These considerations were confirmed by experiment as the direct transformation, at temperatures up to 2400° C and pressures up to 90,000 atm, has not been possible within reasonable time limits *ie* within several weeks. The problem of using this intermediate phase for initiating the transformation has been solved by introducing a solvent for the carbon so that the dissolved graphite forms a saturated solution. It is desirable that the solvent is present in the molten phase, and in the solution a state of supersaturation (20%) of the carbon atoms is created, with regard to the diamond phase of carbon. The selection of a solvent is limited by the condition that the atomic carbon in solution must not combine with other elements to form a composition which is more stable than diamond in the zone of the phase diagram in which the transformation occurs. It is then necessary to reduce temperature and pressure, without retransformation of diamond into another form of carbon. An example of a composition containing carbon capable of transformation into diamond is silicon carbide. Nickel or cobalt may also serve as solvent. 15 claims, 1 illustr.

J *Fh Ha.545*

PHYSICAL, CHEMICAL, & MECHANICAL PROPERTIES OF HARD MATERIALS

Metalworking report : cutting

Anon. *Amer Mach* 1961 Vol 105 (18) p 3 (Sep 4)

A new cutting tool material, Hoybide CW, is claimed to be the finest grain carbide ever marketed. The material is said to be composed of super sub-micron size grains and is said to provide better finish and wear resistance than other grades for machining high strength, heat resistant, alloys.

D *Bfx Ceq Pdc Rg*

Ultrahigh strength materials of the future

J. J. Gilman. *Mech Engng* 1961 Vol 83 (9) p 55 (Sep)

There are good reasons to suppose, it is said, that strong engineering materials of the future will have the form of mono-crystals, will be brittle, and will be composed of interstitial compounds of the transition metals or of covalent compounds of the light elements. Various compounds of carbon seem especially attractive. Carbon carbide (diamond) is the hardest material now known, but its ultimate strength in tension might not be as great as that of some anisotropic crystals.

B *Ba.132*

Carbon and graphite

N. J. Johnson. *Ind Eng Chem (International Edit)* 1961 Vol 53 (5) pp 413-416 (May) ; *Bull Brit non-ferr Met Ass* 1961 Vol 41 (386) p 372 (Sep)

A review of properties. Application in high temperature plants. 40 references.

D *Bhb U*

Micron-sized silica introduced in commercial quantities

Pennsylvania Glass Sand Corp. *Amer ceram Soc Bull* 1961 Vol 40 (9) p 24a (Sep) ; *Ceram Age* 1961 Vol 77 (9) p 34 (Sep)

Min-U-Sil is available in four standard grades of 5, 10, 15, and 30 microns. Grinding time for glazes is said to be substantially reduced with this compound, one plant reporting a reduction of 75% over previous methods. Tests show, it is stated, that a smoother surface finish is obtained. 1 illustr.

D *Rl.25*

Chromalloy cutting carbide composition machines easily, heat hardens to Rh70C

Sintercast Division, Chromalloy Corp 171 Western Highway, West Nyack NY. *Amer Mach* 1961 Vol 105 (18) p 137 (Sep 4)

Ferro-Tic J, a cutting grade carbide, is a sintered composite of carbide particles dispersed in a HSS matrix. This, it is claimed, allows the easily shaped material to retain a cutting life that compares favourably with that of conventional carbides, which must be shaped with diamond grinding. The life of tools made with the new material is said to be up to ten times that of high speed steels. 1 illustr.

D *Pdc Rg.21*

Linde alumina abrasives

Linde Co, Div Union Carbide Corp, 30E 42 St, New York 17, NY. *Instruments and Control Systems* 1961 Vol 34 (2) p 214 (Feb)

Suitable for sharpening, honing, or polishing work, these abrasives may be used dry or as a paste. Type A and C remove stock faster than Type B, but Type B produces a superior finish. 1 table.

D *Chc Rj*

Sapphire whiskers in silver

General Electric Co. *New Sci* 1961 Vol 11 (254) p 799 (Sep 28)

General Electric is said to be experimenting with the reinforcing of metals with sapphire whiskers. An analogy is drawn with the steel rods that are put in reinforced concrete. The aim of the research is to make metal composites which will perform well at temperatures far above their normal average.

D *Bfbb Vwl.131*

Tungsten die steel

Carpenter Steel Co, Reading, Pa. *Tool mfg Engr* 1961 Vol 47 (2) p 111 (Aug)

A new tungsten tool and die steel, Carpenter Hi Wear 64, is said to offer up to four times the service life of high carbon, high chrome steels.

D *Px Sw*

USP 2,961,325 (June 21, 1957) **M. J. Mayfield, American Lava Corp**

Cermet bodies

Cutting tool tips which are tough and chip resistant, have improved impact resistance and rupture strength, remain essentially free of chip welding and at relatively low temperature during high speed cutting are made from alpha alumina bodies containing certain modifiers. A discontinuous metallic phase is distributed throughout a ceramic matrix including alpha alumina crystals (80%). The metallic phase is essentially nickel, accounting for at least 0.1% and no more than 7% of the weight of the body. The ceramic matrix contains also a small amount of a nickel spinel of alumina and may contain a magnesium spinel of alumina. The material may also be used in the form of abrasive grains for grinding. 12 claims, 1 illustr. Ref cited: 3 USP; Iron Age 1948.

J *Az Blf Qc.545*

FP 1,243,892 (Sep 9, 1959) **General Electric Co**

Abrasive material and method of its preparation. Matière abrasive et procédé pour sa préparation

The material is a new physical form of boron nitride which can be subjected to temperature of 1500 to 2000° C without deterioration. Such temperatures occur when grinding such materials as silicon carbide. Diamond reacts at these temperatures with oxygen and may be converted back to a graphitic structure. Cubic boron nitride, whose atomic structure corresponds to that of zincblende, is obtained by subjecting ordinary boron nitride or any other source of boron and nitrogen to elevated pressure and temperatures in the presence of a catalyst selected from the alkali or alkaline-earth metals, brass, lead, antimony and the nitrides of these metals. The abrasives are prepared by bonding the cubic boron nitride to a suitable support. A grinding wheel may be made by placing a mixture of powdered resin and cubic boron nitride in a mould around a central part filled with powdered resin. The assembly is then cured by heat and pressure. Cubic boron nitride may be used for grinding and polishing diamond. 7 claims, 6 illustr.

J *Ba Cs.545/Fh Ha.545*

DIAMOND, ETC, IN INSTRUMENTS

The Profilometer, an American surface measuring device. Das Profilometer, ein amerikanisches Oberflächen-Messgerät

Anon. *Draht* 1961 Vol 12 (9) pp 444-445 (Sep) (In German)

The Profilometer is a portable, electro-mechanical surface measuring device, with which the arithmetical mean roughness value Ra according to DIN 4762 (CLA) or the geometric mean roughness value Rs (r.m.s.) can be measured and read off. A diamond tipped feeler is used, and interchangeable tips are available as an extra for the measurement of difficult-shaped workpieces. 4 illustr.

B *Ndb Wgfb.342*

A new profilograph-profilometer for surface roughness

A. I. Boyarov, L. A. Vyatich, Yu. V. Kleumenov, G. I. Ovcharenko. *Machines & Tooling* 1961 Vol 32 (2) pp 17-21 (Original in Russian)

An apparatus to measure surface roughness according to the criterion Ra using a diamond feeler-needle, developed in 1959 by the Lenin All-Union Electro Technical Institute (VEI) and the Kaliper factory has now been further improved. 7 illustr.

B *Cx Ndb Wgfb*

Diamond knife ultra microtomy of metals and the structure of microtomed sections

R. Phillips. *Brit J appl Phys* 1961 Vol 12 (10) pp 554-558 (Oct)

The parameters of microtome sectioning are defined, and the use of the diamond knife ultra-microtome for metallurgical studies is described. The effect of cutting stresses on the formation of sections is discussed. 9 illustr, 20 ref.

B *Bfa Ceg Nfm*

Diamonds discovery—use in transistors

General Electric Research Lab, Schenectady, NY. *Daily Telegraph* 1961 (33,089) p 19 (Sep 6)

Synthetic, semi-conducting diamonds, so far only of the positive current carrier type, have been successfully produced. These diamonds, extremely rare in nature, are made semi-conducting by the addition of such impurities as boron, beryllium, or aluminium. The search for a process that will produce negative current carrying diamonds is continuing, it is stated.

D *Fh Web/Fn Web*

USP 2,960,759 (Dec 27, 1957) **R. J. Bondley, General Electric Co**

Methods of manufacturing phonograph styli

A temporary holder of, for example, molybdenum is recessed from one end and diamond is bonded in the recess by solder. The end with the diamond is then ground to form a conical point and the pointed diamond released by heating the assembly. The conical point of the diamond is then mounted in the rod which is to form the finished stylus and, as all diamond points will have the same dimensions, it is possible to prepare the rods uniformly for the final bonding. The bonded diamond is then ground and lapped to finish size on a diamond lap and the point to a radius of approximately 0.001 inch. 63 claims, 5 illustr. Ref cited: 5 USP; 1 BP.

J *Nfs Qc.545/Tde Qc.545*

LITERATURE REQUESTS

Please quote the page number of the journal which contains the original reference, and the author and title of the article, in all cases.

FP 1,239,157 **D. E. Birt, P. J. Pike, Electrical & Musical Industries Ltd**
(Oct 29, 1958 ; Oct 15, 1959—Great Britain)

Method of fixing precious stones on metallic pieces. Procédé de fixation des pierres précieuses sur des pièces métalliques

In the manufacture of gramophone styli a diamond chip is secured to a circular shank of oxidisable metal, such as mild steel wire, by providing the shank with a plating of copper and, if desired, of silver, placing the diamond in contact with the plating and heating the assembly in the presence of an active metal flux, such as titanium or zirconium hydride, to cause the diamond to be bonded to the shank. The shank and diamond are shaped on grinding wheels made of sintered metal and diamond particles and the shank is soldered to the arm of a pick-up. 11 claims.

H *Pc Qc.545*

HARDNESS, WEAR TESTING, AND PRECISION GAUGING

Grinding wheel hardness

Anon. *Tool mfg Engr* 1961 Vol 47 (2) p 111 (Aug)

Development of a new method of determining the hardness of grinding wheels has been reported by the University of Michigan. The test, which can be run on a wheel in just a few seconds, involves crushing small amounts of abrasive from the surface of the grinding wheel by contact with a hard steel wheel. The steel wheel—small and conical in shape—is mounted at 45 deg to the surface of the grinding wheel, on a spindle attached to a force measuring dynamometer. In testing, the grinding wheel is rotated and the small wheel passes over its surface. Reaction forces measured by the steel wheel provide a sensitive indication of significant variations in wheel hardness.

D *Ab Cv.1456/Pe Unh*

Form error-measuring instrument

Anon. *Instrum Pract* 1961 Vol 15 (9) p 1155 (Sep)

The Elliott 'Rondell', is a form error-measuring instrument which measures not only the roundness errors of an object but also errors in concentricity, in perpendicularity, in parallelism and in axial alignment, to within 3 micro-inches.

B *Unfz Vfd W*

Surface roughness measurement

Anon. *Power Transmission* 1961 pp 346-350 (June) ; *PERA Bull* 1961 Vol 14 (9) p 260 (Sep)

Describes some new techniques developed for the examination of surfaces by interferometry.

D *Vs*

Device speeds up repetition work

Anon. *Metalworking Prod* 1961 Vol 105 (37) p 13 (Sep 13)

The Micro-Guide, claimed to enable repetition of work on many types of machine tools to be carried out at an increased speed, and with closer precision than previously by semi-skilled operators, has been designed by Paramatic Development. 1 illustr.

B *Pr Pscz*

Surface texture [British Standard 1134]

Anon. *Tooling* 1961 Vol 15 (10) p 57 (Oct)

BS 1134 lays down the principles by which the irregularities both of machined and 'natural' surfaces can be assessed numerically and in addition gives a very comprehensive picture of measuring techniques and problems. It provides an international language for use in discussing and transmitting information on roughness characteristics and assessment and lays down the requirements with which surface assessment instruments should comply in order to ensure compatibility of performance.

B *Unf.255.321*

Roughness comparison specimens. Types produced by point cutting

Anon. *BSI News* 1961 p 33 (Sep)

Part 2 of BS 2634 will relate to specimen surfaces exhibiting various grades of centre-line average height (CLA) texture, produced by turning, shaping, milling and other point cutting processes. The specimens are for use as references in making qualitative, tactile, and sight assessments of the roughness of work piece surfaces produced by the same machining processes. It will constitute a companion specification to Part 1, 'Ground flat and cylindrical types'.

B *Cx.193*

Automatic inspection—the machine does it all

Anon. *Tool mfg Engr* 1961 Vol 47 (3) pp 96-98 (Sep)

A hemispherical missile part which would take 125 hours to inspect by conventional methods is, it is claimed, being checked in two hours by a new tape controlled machine that prints out a record of all measurements. Weighing 16 tons, the five axis machine can accommodate parts up to 20 in. high and 20 in. in diameter, will measure any point or angle within the 20 in. gauging range to an accuracy of 0.0001 in., with repeatability over this range claimed to be within ± 0.000005 of an inch. 3 illustr.

D *Qd Wb*

Hardness-tensile strength conversion for Rockwell hardness C scale

Anon. *Mat Res Stand* 1961 Vol 1 (6) pp 448-451 (June) ; *Instrum Abstr* 1961 Vol 16 (8) p 659 (Aug)

D *Unhcd*

Hardness measurements

F. P. Volosevich. *Izm tekh* 1960 (11) pp 28-29 (Nov) ; *Library of Congress Mthly Index Russ Access* 1961 Vol 13 (11) p 3482 (Feb) (In Russian)

D *Unh Vfd.21*

Testing machines and testing equipment for metallic materials. Prüfmaschinen und Prüfeinrichtungen für metallische Werkstoffe

H. Mintrop. *Z Ver Dtsch Ing* 1961 Vol 103 (27) pp 1363-1369 (Sep 21) (In German)

Includes a section on hardness testers and reviews the equipment available in this field. 139 ref.

B *Bf Cv Wgh*

Mechanical foundations of hardness testing

V. K. Grigorovich. *Trans Inst Metall AN SSSR* 1960 (5) pp 244-249 ; *Ref Zhur : Mekh* 1961 (8) p 56 (Aug) (Abstr) (In Russian)

The author reviews the various methods of hardness testing by indentation, and draws some general conclusions on design and interpretation of results.

D *Cvd.1456*

7th European Machine Tool Exhibition — Brussels : Loewe type SP optical profile grinder

Ludwig Loewe & Co, Berlin, West Germany, Brit Rep : George H. Alexander Machinery, Ltd, 82-84 Coleshill St, Birmingham 4. *Machinery, Lond* 1961 Vol 99 (2546) p 487 (Aug 30)

The latest type SP optical profile grinder has a 19¾ in. square screen and magnifications of 25 × and 50 × are available, the direct viewing area at 25 × being ¾ in. square, and at 50 × ⅜ in. square. It is stated that the working area is projected with a minimum accuracy of 0.0001 inch. A dressing attachment is provided directly above the grinding wheel. 1 illustr.

D *Psf:Chch Pr.27.3235*

Optical attachment for visual grinding

Parker-Hartford Corp, 650 Franklin Ave, Hartford, Conn, USA. *Tool Mfg Engr* 1961 Vol 47 (2) pp 99-100 (Aug) ; *Mach Tool Blue Bk* 1961 Vol 56 (8) pp 193-194 (Aug)

The Profiloscope provides visual control for precise grinding on surface and cylindrical grinders. Width, depth, and coordinate checks are facilitated to readings of 0.0002 in. on special form tools. 1 illustr.

D *Chcl Pr Wct/Chcm Pr Wct*

Marposs electronic gauging equipment

Apparecchi Elettronici Marposs, Bologna, Italy ; Machine Tool Sales Ltd, 79 Portland Place, London W I. *Machinery, Lond* 1961 Vol 99 (2547) p 551 (Sep 6)

The Dirac unit is for internal measurement with a capacity for bores up to 3 in. diameter. The Finar unit stops the machine when the work has been ground to size, has a capacity of 2 in. diameter, and may be interconnected with the Dirac unit. Other equipment includes the Convar gauge for measuring widths, and the type CFAC swing-down gauge, which is supplied with four interchangeable and adjustable caliper members for diameters from 0.315 to 8 inches. Readings to 0.00004 in. can, it is claimed, be obtained with these gauges. 1 illustr.

D *Wbblz*

Precise measurement of the straightness of cylindrical surfaces

R. G. N. Hall. *Engr, Lond* 1961 Vol 212 (5508) pp 273-275 (Aug 18)

This article describes an interferometric method, using simply constructed equipment, by which the straightness of a generator of a cylindrical surface up to 12 in in length may be measured, without damage, to an accuracy of ±5 micro-in. even when the total error may be as much as 100 micro-inches. A simple method of pen recording is described which enables the magnitude and sign of the errors to be deduced directly. 3 illustr, 4 ref.

D *Ag Unfz Vs*

Methods of hardness testing Pts I and II

K. Iidzuka. *Keisoku J Soc Instrum Technol, Japan* 1960 Vol 10 (9) pp 559-564 ; Ref : *Zhur : Mekh* 1961 (9) p 9V428 (Sep) (Ref in Russian, original in Japanese)

D *Cv.1456*

Gage for surface inspection of scratches, grooves

Bausch & Lomb Inc, Rochester 2, New York. *Mach Tool Blue Bk* 1961 Vol 56 (9) pp 254, 256 (Sep)

This gauge, which is claimed to measure scratches, grooves and other indentations on flat or curved surfaces to an accuracy of 0.0001 in. or 5% of depth, is designed for inspecting materials where scratches exceeding specific limits could result in structural failure.

B *Az Vfd Wbb*

Rockwell hardness testing machine

Clark Instrument Inc, Dearborn, Mich. *Machinery, NY* 1961 Vol 68 (1) p 216 (Sep)

Of horizontal type, this machine is designed for easy loading and operating and to ensure accurate, efficient testing of large size pieces. The head swings 180° to allow accurate checking of the outside, pitch, and root diameters of gears.

D *Wghc*

USP 2,962,890 (Nov 25, 1957) **J. Borrino, Sinclair Research Lab Inc**

Wear tester

Most previous wear testing devices are subject to the disadvantage that as soon as a slight amount of the specimen and/or the wear member is eroded, the contact pressure changes and the test results become misleading. This is avoided in the design according to Fig 2. Ball 23 is rotated by friction through bifurcated member 24, coupled to motor 10 by cross member 14 in shaft 12. The ball will erode specimen 15 without any alteration in pressure, which is only dependent on the weight of member 24. The apparatus operates in container 29 which may be closed by cover 30 if the tests are to be carried out in an abrasive atmosphere. The coupling may comprise magnetic parts. 3 claims, 4 illustr. Ref cited : 3 USP ; period : 1958.

J *Bfc Cw Wgm.545*

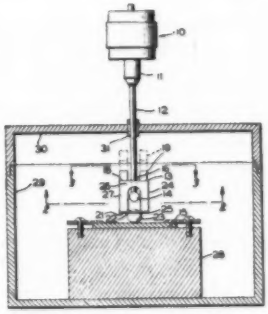


Fig 2. USP 2,962,890.

TRUING OF GRINDING WHEELS

Camshaft grinding machine with high degree of machining accuracy. Kurbelwellen Schleifmaschine mit hoher Fertigungsgenauigkeit

Anon. *Die Maschine* 1961 Vol 15 (9) p 77 (Sep) (In German)

A new camshaft grinder with a newly developed diamond wheel truing device for particularly accurate finishing has been announced by a British firm.

B *Nj Psf:Agz Chc Pr*

Swivelling radius-dressing device for grinding wheels. Schwenkbare Radius-Abrichtvorrichtung für Schleifscheiben

Anon. *Fertigungstechnik u Betrieb* 1961 Vol 11 (8) p 553 (Aug) (In German)

The device is a permanent fixture on the machine, thus saving time needed in setting-up and removal. 4 illustr.

B *Ab Cg Ps/c*

Dressing-diamond mountings. Fassungen von Abrichtdiamanten

L. Burgham. *Klepzig Fachberichte* 1961 Vol 69 (7) pp 259-260 (July) (In German)

Two of the many methods of setting dressing diamonds are discussed, and it is shown how important is this matter, which is usually overlooked or taken for granted. 2 illustr. *B* *Mfb Nj*

Dressing shaped abrasive wheels by diamond rollers

G. S. Vil'ner. *Machines & Tooling* 1961 Vol 32 (2) p 41 (Original in Russian)

See also *Industr Diam Abstr* 1960 Vol 17 p A213 (Sep). *B* *Ab Cgh Njz*

B.S.A. No 0 drill-pointing machine

BSA Tools Ltd. *BSA Tools Div J* 1961 Vol 4 (6) pp 10-12 (Aug)

The machine is designed to grind from 1/16 to ¼ in. (1.5 to 13 mm) diameter right-hand, two-flute drills having either parallel or taper shanks using unskilled labour. The grinding wheel can be dressed 'off hand' using a diamond or Carborundum stick. 3 illustr.
D *Ab Cg Nj/Alb Chc Pr*

7th European Machine Tool Exhibition — Brussels : Schou No 330 heavy-duty travelling-head surface grinding machine

Stedall Machine Tool Co, 192 Pentonville Rd, London N 1. *Machinery, Lond* 1961 Vol 99 (2546) p 501 (Aug 30)

Workpieces with heights up to 30 in. can be accommodated on the 47 in. by 30 in. worktable of the Schou No 330 heavy duty travelling-head surface grinding machine, and faces measuring 51 in. by 13½ in. can be ground at one setting. A lever operated, swivelling, dressing unit is provided which can be adjusted vertically through a distance of 10 in., and to enable feed increments to be applied accurately, the plunger of a dial gauge can be brought into contact with the upper surface of the work. 1 illustr.
D *Chcm Pr.27.3235*

New model SS radius dresser

Somerset Tool Co, 220 Virginia St, Hillside, NJ. *Amer Mach* 1961 Vol 105 (18) p 142 (Sep 4)

This radius dresser will, it is claimed, dress all wheels up to and including 14 in. diameter with an accuracy of 0.0002 of an inch. The dresser operates from below so that there is no need to remove the wheel guard. 1 illustr. *D* *Psfc*

Geometric surface wheel dresser

Crystal Lake Engng Co, Crystal Lake, Ill. *Cutting Tool Engng* 1961 Vol 13 (9) p 28 (Sep)

A lower-cost method of formed wheel grinding is said to be possible by the recent introduction of a newly designed geometric surface wheel dresser. Two diamond mountings are furnished, the vertical for dressing small, concave wheels, and the horizontal for all other wheel surfaces. 1 illustr. *B* *Ab Cgh Nj Psf*

Gear grinder

Gear Grinding Div, Michigan Tool Co, 7171 E McNichols Rd, Detroit 12, Mich. *Mod Mach Shop* 1961 Vol 34 (2) pp 189-191 (July)

Developed to crown grind the teeth of spherical gear type couplings, the Model CGG-16x 18 FA crown gear grinder, includes provision for automatic dressing of the wheel to the proper form, and compensation for wheel wear as required. 1 illustr.
B *Abmd Cgh Psf/Ad Cgc Pr*

7th European Machine Tool Exhibition — Brussels : Giustina grinding machines

Giustina SpA, Turin, Italy ; Brit rep : Elgar Machine Tool Co Ltd, 172 Victoria Rd, London W 3. *Machinery, Lond* 1961 Vol 99 (2546) pp 485-486 (Aug 30)

Type R90/C centreless grinder is suitable for both plunge-feed and through grinding and has a capacity range from 1/16 in. to 8 in. diameter. The grinding wheels are dressed by hydraulically-operated diamond dressers mounted in anti-friction ways. A device for automatically balancing the grinding wheel can be supplied. 2 illustr.
D *Nj Psf:Chcc Pr.27.3235*

BP 860,664 (June 10, 1957—USA) **Super-Cut Inc Method of and apparatus for dressing grinding wheels**

In known truing apparatus, a point in the diamond crystal structure is selected on the cube or (100) plane and presented to the grinding wheel and the traversing operation is effected until a critical flat is worn on the diamond, when the tool is rotated about its axis so that a fresh surface is applied to the wheel. The procedure is repeated until the diamond is worn beyond usefulness. Such a method requires the use of large, expensive diamonds and only about 20% of the diamond structure can be fully used. These limitations are overcome by using a continuous repetitive method and an apparatus whereby the diamond is always orientated so that its (110) crystal direction is parallel to the direction of abrasion whereby resistance thereto is great. The tool Fig 3 comprises a shank 12 carrying a diamond 14 and clamped on a holder 18 by a screw and pivot 32 and adjustable in any of three positions by a screw 46 engaging any of the holes 38, 40, 42.

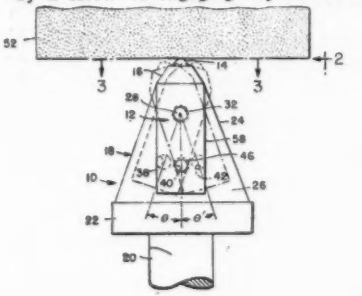


Fig 3. BP 860,664.

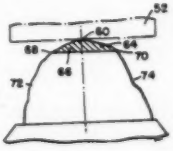


Fig 4 (above).

Fig 6 (below).

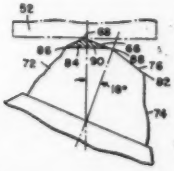
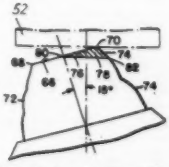


Fig 5 (above).



The wheel 52 Fig 4 is traversed by the diamond mounted with its edge 60 normal to the wheel and parallel to the (110) direction until a critical flat 66 is obtained and new edges 68 and 70 are formed which are also parallel to the (110) direction. The diamond is then adjusted to present in turn the edges 70 and 68 to the wheel, Fig 5 and 6. The process is repeated until the diamond is worn away. 12 claims, 11 illustr.
H *Ab Cg Nj Psf.545*

PRECISION MACHINING OF METALS

Diamond turns out a smooth finish

Anon. *Tooling & Prod* 1961 Vol 27 (6) p 55 (Sep)

No lapping, honing or polishing are necessary in the production of copper and zinc faced printing rolls, cylinders and mills, a one micro-in. finish being achieved in one pass with a single point diamond tool. It is claimed that workpiece concentricity is held to 0.001 in. over 30 in. of length, with a tool feed of 0.0015 in. The highest speed that can be obtained with the lathe in use is recommended, in this case 500 rev/min. Other applications of diamond in industry are mentioned, including the boring of thin-walled tubing where the minimum of pressure is required. 1 illustr.

D *Agc Bfh Ceqb Nf/Agc Bfj Ceqb Nf*

Thoughts on the theory and practice of ultra-high speed machining. Gedanken zur Theorie und Praxis der Ultra-Schnellzerspanung

M. Kronenberg. *TZ f prakt Metallbearb* 1961 Vol 55 (8) pp 443-446 (Aug) (In German)

The author, who had participated in the ultra high speed cutting research programme, presents a number of recent thoughts on this topic, among them a discussion on the definition of ultra high speed machining, the modified chip formation, chip thinning instead of chip compression, diffusion and relaxation time from dimensional analysis, impact waves, metal removal rates in comparison with present practice and with erosive and similiar machining processes and stress strain relationships at high strain rates. 6 illustr, 4 ref, 1 table. *B* *Ceqr.21*

The effects of vibrations on the cutting of metals

R. Weill. *Microtecnic* 1961 Vol 15 (4) pp 133-139 (Aug)

The conclusion reached in this survey is that feeds may be increased, under certain conditions, producing greater cutting tool vibration, without any subsequent decrease in tool life. Further tests are being carried out. 12 illustr, 3 ref.

D *Bf Ceg Pd Qn Uqe*

The manufacture of the Werra miniature camera

P. Oswald. *Werra*, suppl to *Jena Review* 1961 pp 30-35 (In English)

In order to give the camera its very pleasant appearance, it is stated that certain surfaces on the individual parts are precision turned by means of diamonds. These parts are almost exclusively light metal. The complete manufacturing cycle is described in some detail. 9 illustr. *D* *Az Bfv Ceq N*

The use of designed experiments in metal cutting research

J. Taylor. *Prod Engr* 1961 Vol 40 (10) pp 654-664 (Oct)

2 illustr, 12 tables, 2 ref.

D *Bf Ceg.131*

Relation of cutting temperature to tool life in turning of aluminium alloys

Á. Kardos. *Acta tech hung* 1961 Vol 34 (1/2) pp 71-81 (In English)

The paper deals with the analysis of the two-chisel cutting temperature measurement method. A method of calibration of tools of the two-tool temperature measuring equipment is given. Results of experiments for determining the relation of cutting temperature to machining variables are described. Comparisons are given of results of tool-life tests, and evaluation is given of applicability of the cutting temperature measuring method to machinability tests. 6 illustr, 18 ref. *D* *Bfxc Ceqb Uqe*Bfxc Ceqb Vb*

Diamond cutting tools engineered for production

J. Taeyaerts. *Mech Engng* 1961 Vol 83 (9) p 83 (Sep)

The author warns that diamonds should be used on good, solid, fast machine tools — any vibration will shorten tool life considerably — and that a diamond should never be brought into contact with the work in a stationary position, nor should the machine be stopped in the cut. Too low cutting speeds are associated with diamond failure.

B *N.2592*

The machining process and stress/strain temperature relationship

W. S. Hollis. *Prod Engr* 1961 Vol 40 (10) pp 648-653 (Oct)

7 illustr, 7 ref. *D* *Vb:Ceq.1456*

How can tool life be increased ? Wie wird die Standzeit von Werkzeugen erhöht ?

H. H. Reinsch. *Maschinenwelt u Electrotechnik* 1961 Vol 16 (9) pp 423-424 (Sep) (In German)

B *Pd Uqe*

Diamonds in the precision machining of memory drums. Diamanten zur Präzionsbearbeitung von Speichertrommeln

Sperry Gyroscope Co Ltd, Brentford, Middx. *Industrie-kurier* 1961 Vol 14 (137) p 563 (Sep 6) (In German)

B *Agz Ceq N*

Special boring heads increase cylinder sleeve production

Aluminum Industries, Werk Rd, Cincinnati. *Mod Mach Shop* 1961 Vol 34 (2) pp 114-116 (July); *Tool Mfg Engr* 1961 Vol 47 (2) p 66 (Aug)

Reconditioned Wesson 8-blade precision boring heads were used by the company in their finish-boring operation. These are easily resharpened, it is stated, because only the lead angles have to be reground. Details are given of the way in which increased production was achieved.

D *Agz Cfd Pr*

A high productive toolfitting for automatic production

G. M. Ryvkin. *Machines & Tooling* 1961 Vol 32 (2) pp 2-12 (Original in Russian)

For increasing the effectiveness of automation it is essential to develop and use a special tool fitting, which will increase the accuracy and reduce the unit cost of machining. The article suggests different designs of special tool fittings for a given type of automated production. 11 illustr, 14 ref.

B *Pr Prs.256*

Experience in machining tough alloys

Ryan Aeronautical Co. *Tooling* 1961 Vol 15 (10) pp 54-56 (Oct)

A thorough investigation has been carried out of new techniques and new tools for working the new metals necessary in the construction of missiles, jet engines, rocket motors, and high-speed aircraft. As a result speeds triple those formerly used in machining stainless steel and high temperature alloys are employed. Throw-away carbide inserts, and special machines to grind them, giving finer and more accurate cutting edges, produce improved quality, it is claimed. 2 illustr.

B *Bfx Ceq Pdc*

Turning aluminium alloys

Anon. *Tool mfg Engr* 1961 Vol 47 (2) pp 71-72 (Aug)

It is stated that aluminium alloys are easily machined with carbide cutting tools. Tables of speeds and feeds are given. 3 tables.

D *Bfxc Ceqb Pdc*

Diamond edged knives give metal specimens 0.000,0005 in. thick

E. I. DuPont de Nemours & Co, Wilmington Del. *Amer Mach* 1961 Vol 105 (18) p 140 (Sep 4); *Mach Tool Blue Bk* 1961 Vol 56 (9) pp 221-222 (Sep)

Diamond edged knives that will cut metal to half millionth inch thickness permit electron microscope specimens to be prepared by slicing. Furthermore, metal specimens for ordinary microscopic examination can be obtained without grinding and polishing. The knives, which can be provided in sizes up to ¼ in., are said to give tolerances 10 times more accurate than the usual tenths that are obtained by other mechanical means of specimen preparation. The manufacturer will supply sharpening service.

D *Bfa Ceg Nfm*

Wallace plate cutting machine gives 60 to 100 micro-inch finish on aluminium

Wallace Supplies Mfg Co, Chicago 14, Ill. *Amer Mach* 1961 Vol 105 (18) p 140 (Sep 4)

The machine's 20 in. carbide-tipped wheel is locked for cutting non-ferrous metal and oscillates for ferrous metal cutting, change-over from ferrous to non-ferrous cutting being made, it is claimed, in under five minutes. A larger version of this machine has a 26 in. wheel. A finish of under 125 micro-in. is claimed on steel. 1 illustr.

D *Bfg Ceg Pr Unf*

FP 1,248,154 **M. L. Spira**
(Feb 25; Aug 8, 1959—Switzerland)

Machine for drilling hard materials. Machine destinée auperçage de matières dures

The machine is designed for drilling hard metal, ceramics, industrial stones such as drawing dies, or horological jewels and is characterised by the use of vibrations of feeble amplitude in the direction of the drilling axis impressed on the drill support and on the workpiece holder. The vibrations are created by an electro-magnet fed by alternating current. The frequency is controlled by a regulating device. 17 claims, 4 illustr.

J *Ba Cfb Pr.545*

CUTTING AND MACHINING OF STONE, GLASS, ETC.

The grinding of stove tiles. Schleifen von Ofenkacheln C. Stürmer. *Glas-Email-Keramo Technik* 1961 Vol 12 (9) pp 316-319 (Sep) (In German)

The problems arising in the manufacture of stove tiles, as to finishing by grinding, are treated from the point of view of development and that of ceramic grinding technology. It is shown which improvements and which economical advantages are attainable in manufacturing by treating stove tiles by means of continuous parallel grinding in using high-duty grinding tools and machines. Thereby it is possible to avoid disturbing differences of dimensions, on similar ceramic products. 3 illustr.

B *Az Bl Chc.1456*

The invention of the glaziers diamond for cutting glass sheet

S. Tolansky. *Diamant* 1961 Vol 4 (33) pp 9-10 (Aug) (In English, French and Flemish)

B *Az Bm Ceg Ncb*

Handbook on glass manufacture Vol II

F. V. Tooley. *J Amer ceram Soc—Abstr* 1961 Vol 44 (8) p 201 (Aug)

Book, Ogden Publishing Co, New York 36, 1960, 276 pp. Price $10.

Typical mechanical operations for cutting, grinding, polishing, and drilling glass are reviewed, and grinding and polishing of plate glass are also covered.

[Not in library of Industrial Diamond Information Bureau].

D *Bm Ceq.52*

Laminated plastics

Synthane Corp. *Mech Engng* 1961 Vol 83 (9) p 127 (Sep)

A brochure describing techniques for machining hard grade laminated plastics, including circular sawing, band sawing, turning and boring, threading, automatic screw machining, drilling, milling, gear cutting, punching and machining. Recommendations on tools to be used, speeds, feeds, cooling and lubrication, *etc* are given for each operation.

B *Bp Ceq.21.523*

Resistors for Nike-Zeus made on a completely automated line

Western Electric Co. *Bell Lab Rec* 1961 Vol 39 (8) pp 295-297 (Aug); *Instrum Pract* 1961 Vol 15 (9) pp 1116-1118; *Engr's Dig* 1961 Vol 22 (9) pp 88-90 (Sep)

Carbon deposited resistors with a ceramic core are being turned out at a rate of one every three seconds by a computer-controlled production line, it is claimed. A helixing machine, using a diamond impregnated wheel, is incorporated in this production line to cut the spiralled groove in the carbon film, which gives the resistor a precise value.

B *Az Bhb Cegd Nv Pr*

Belgian machine tools : machines for the optical industry. Belgische Werkzeugmaschinen : Maschinen für die optische Industrie

R. Molle, G. Boitte. *Werkst u Betr* 1961 Vol 94 (9) p 709 (Sep) (In German)

The Optibel display at Brussels included : the GMD, which is claimed to finish a half circle (convex or concave) up to a diameter of 350 mm, the NTB, for grinding ring-shaped glass, the MCM for the rough machining of cylindrical, and spherical convex surfaces with diamond tools, and the MTP and MTA for the rough machining of cylindrical, spherical convex and concave lenses.

B *Bm Chc N Pr.27.3235/Bm Chc Pr.27.3235*

USP 2,963,926 (Jan 12, 1960) **V. J. Fantozzi, C. Stelmachowski, Super-Cut Inc**

Method of and fixture for mounting abrasive segments on saw blades

Large gang saws are frequently employed for sawing large blocks of marble, granite, concrete, *etc*. The machines are conveniently mounted over flat rail cars carrying the work. During reciprocation, the centrally disposed abrasive segments are longer in contact with the material than the segments at the ends, and therefore wear faster. Rearrangement of the segments, especially if they contain expensive diamond grains, is desirable but difficult because of the necessary correct adjustment of the segments of varying heights. The fixture is so designed that the segment is held in place approx in operative position, then automatically displaced on melting the silver solder applied to the segment, and positively guided to its final operation position during the solidification of the solder for permanent bonding of the segment. 19 claims, 9 illustr. Ref cited : 1 USP.

J *Pc.545*

USP 2,960,978 (Apr 24, 1959) **F. Dustan, Fitchburg Engng Corp**

Machine for sawing crystals and other hard materials

The machine is designed for severing thin wafers from semi-conductor crystals, ferrites, quartz, and other hard materials. It is a swing saw type device, with a diamond saw producing smooth cuts with extreme accuracy (thousands of an inch). This saw blade is reciprocated in a plane at right angles to the motion of the table holding the workpiece while the table is stepwise indexed. After each cut the table is retracted by hydraulic means in the opposite direction away from the saw blade so that the blade does not contact the sawn face on its return movement. The machine operates automatically so that no attention is required except to remove the severed wafers and apply fresh crystals to the work support on the table. 13 claims, 7 illustr. Ref cited : 1 USP ; 1 BP.

J *Az Ba Ceg Pc.1456.545*

USP 2,964,848 (Feb 18, 1958) **A. Gonsalves**

Portable glass cutting machine

The glass cutting machine is provided with self contained squaring and measuring devices so that the glass can be cut on location. The device is essentially a T-shaped holder 12 as seen in Fig 7 and 8 with a slot 13 in which cutter 15, 16 is guided. 20 are rolled tape measures to be clamped by screwing device 26 in any convenient position. 1 claim, 6 illustr. Ref cited :

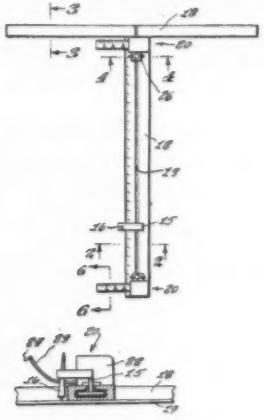


Fig 7 (top) and 8 (bottom). USP 2,964,848.

GEM POLISHING

New method of cutting diamonds

Anon. *Diamond News* 1961 Vol 24 (11) p 35 (Aug)

A new method of sawing diamonds has been developed by Industrial Distributors Ltd, Johannesburg. The stone to be sawn is immersed in paraffin and a spring-loaded metal blade is placed on it. The blade is coupled to an electrical supply at several thousand volts and the diamond beneath the blade is eroded away.

B *F Hl.1456.361*

Diamond cuts and colours

R. Webster. *Watchmaker* 1961 pp 60-65 (Apr)

Deals with the various types of diamond cuts, how to differentiate between diamond and imitation stones, and many other interesting facts about diamond cutting. *E* *F Hkb/F Hl Uk*

Princess diamonds

A. Nagy, Diamond Polishing Works Ltd. *Goldsm J* 1961 Vol 67 (512) p 451 (Oct)

After 12 years' intensive research, a new technique for cutting diamonds, described as 'possibly the most important development in the 480 years of diamond cutting' is soon to be introduced. The Princess cut, developed by Mr. Alfred Nagy, has a diamond thickness of no more than 1.5 mm. 2 illustr.

D *F Hl.132*

ROCK DRILLING

Boring under hazardous conditions

Anon. *Wimpey News* 1961 (238) p 3 (Oct)

Marine borings are described, using a diamond drill, under very hazardous conditions at Wylfa Head, Anglesey. The borings are being conducted by G. Wimpey & Co Ltd, in connection with a proposed power station. 3 illustr.

D *Bnt Cfb Nh*

This month in mining

Anon. *Engng Min J* 1961 Vol 162 (8) pp 18-19, 100-149 (Aug)

The article contains several examples of diamond drilling in various parts of the world.

D *Cfb Nh*

Mining miscellany

Anon. *Min J* 1961 Vol 257 (6581) p 347 (Oct 6)

It is planned that the hole of an oil well, the design of which has been completed by the USSR Drilling Technique Research Institute, will penetrate 32,000 ft, the dril'ing being accomplished by means of a diamond bit of Soviet manufacture, which has already been made and is at present undergoing tests.

D *Nhb.33*

Mining miscellany

Anon. *Min J* 1961 Vol 257 (6579) p 294 (Sep 22)

A diamond drill hole is to be put down by the Mines Department to test nickel deposits at Beaconsfield, Tasmania, to a depth of at least 250 feet. These deposits have been known for some years but so far work has been confined to the surface and to some shallow boring. *D* *Cfb Nh.38*

Deep drilling in the USSR

Anon. *Min J* 1961 Vol 257 (6579) pp 279, 281 (Sep 22)

Russian plans to drill to the comparatively unknown boundary between the crust and the inner core of the earth known as the Mohorovic discontinuity are described in this article. The author concludes that indications are that the Americans may be the first to reach the Mohorovic layer.

D *Bnt Cfb.33*

The origin of the Holleford Crater Breccia

K. R. Dawson. *Canad Miner* 1961 Vol 6 (5) pp 634-646

The paper reports the results of a petrographic and geochemical study of polymict breccia discovered in diamond drill cores from Holleford, Ontario. 5 illustr, 2 tables, 9 ref. *B* *Bna Cfb Nh.12.343*

3470 feet in 30 days

Unidrilling Ltd. *S Afr Min Engng J* 1961 Vol 72 Pt 2 (3578) p 515 (Sep 1)

In one month 3,470 ft of BX-size diamond drill hole was put down through lava formations in the Western Transvaal district, states the author. A Joy No 50 core drill, manufactured by Joy-Sullivan Africa (Pty) Ltd, was used. *D* *Bnt Cfb Nh*

FP 1,239,437 (July 17, 1959) **A. Labecki, Ets Neypric Drilling tools.** Perfectionnement aux outils de forage

In order to obtain regular destruction of the central portion of the bore hole, the axis of rotation of the drill is off-centred relative to the axis of symmetry so that the diamond elements adjoining the centre of the working face of the bit, and whose linear velocity is practically nil, are imparted with lateral motion. The end face of the bit is made slightly convex in order to avoid excessive working of the lateral cutting edges, due to the eccentricity. The orifice through which coolant is led to the end face is off-centred relative to the axis of rotation in order to prevent core formation. 2 claims, 3 illustr.
H *Cfb Nh.545/Cfb Pl.545*

FP 1,240,005 (July 21, 1959) **W. Tiraspolsky Core drill or similar tool for earth drilling.** Trépan ou outil analogue pour le forage du sol

When boring through plastic earth formations, such as clay, or through rock formations of which the bored fragments form a plastic paste with the scavenging fluid, the fluid passages of the drill bit become clogged and further boring becomes very difficult or impossible. The invention is concerned with providing the parts of the bit in contact with the scavenging fluid with a lining of elastomer, natural or synthetic rubber, varnish, lacquer, resin or other material having a low coefficient of adherence with respect to the constituents of the formations bored through. The lining is highly resistant to abrasion by the scavenging fluid and may be elastically deformable to facilitate removal of any plug of material that may have been formed. Three types of lined drill bit are illustrated. 2 claims, 5 illustr.
H *Bnt Cfb Plb.545*

GRINDING AND POLISHING OF CARBIDES AND METALS

7th European Machine Tool Exhibition, Brussels 1961 : Copy grinding machines. 7. Europäische Werkzeugmaschinen-Ausstellung Brüssel 1961 : Kopierschleifmaschinen

Anon. *Industrieblatt* 1961 Vol 61 (8) p 555 (Aug) (In German)

Hard materials, or hardened workpieces may be profiled using the universal copy grinding machine, equipped with a mechanical-hydraulic copying system. 1 illustr. *B* *Chcz Pr.21.3235*

Copyrex—a new copy grinding machine. Copyrex—eine neue Kopierschleifmaschine

Anon. *Klepzig Fachberichte* 1961 Vol 69 (7) p 268 (July) (In German)

The Copyrex works simultaneously with two similar grinding wheels, thus, in effect, cutting the machining time by half. 1 illustr. *B* *Chcz Pr*

Some unusal operations on parts for nuclear-powered submarines

Anon. *Machinery, Lond* 1961 Vol 99 (2547) pp 567-571 (Sep 6)

A 23 in. diameter nickel-copper alloy cylinder, 8 ft long, was honed on a BarnesdriL horizontal machine, which has been modified to accommodate bore diameters from 1¾ to 16 in. and from 17 to 23 inches. Lengths up to 21 ft can be handled. For honing the 23 in. cylinder, abrasive grits ranging from size 120 for roughing to size 320 for polishing were employed and, it is claimed, a 16 micro-in. finish was obtained. Various other operations are described. 8 illustr.
D *Ag Bfxp Chh Pr/Ag Bfxq Chh Pr*

Lapping on single-disk lapping machines for piece and series production of all sizes. Das Läppen auf Einscheiben-Läppmaschinen für die Einzelfertigung und für Serien aller Grössen

K. Häuser. *TZ f prakt Metallbearb* 1961 Vol 55 (8) pp 433-442 (Aug) (In German)

Following a definition of the term 'Lapping' and the importance of lapping machines for lapping operations, the application of lapping , particularly in connection with single disk lapping machines, is discussed. The numerous examples among which the lapping of complex work on single-disk lapping machines is particularly important, provide a general view of the versatility and economy of lapping on single-disk lapping machines. A special chapter is devoted to the measuring of the planeness of lapped surfaces by means of plane-measuring plates. 25 illustr, 15 ref.
B *Chd Pr*

Grinding fluids, Part 3—their selection and use

L. P. Tarasov. *Tool mfg Engr* 1961 Vol 47 (2) pp 57-63 (Aug)

2 illustr, 9 ref. *D* *Sjg.21*

Special drill grinding machine for small drills. Spezialbohrerschleifmaschine für Kleinbohrer

A. Tatar, Stuttgart. *Metall* 1961 Vol 15 (9) p 904 (Sep) (In German)

The machine is claimed to be able to deal with drills from 0.3 to 15 mm, and is fitted with a screen on which a magnified picture of the drill is projected. 1 illustr.
B *Albz Chc Pr*

German machine tools at Brussels : Grinding machines [Hartex centreless grinders]. Deutsche Werkzeugmaschinen in Brüssel : Schleifmaschinen [Hartex Spitzenlose Rundschleifmaschine]

W. Eickhoff, H. Moser. *Werkst u Betr* 1961 Vol 94 (9) pp 587-588 (Sep) (In German)

The Hartex centreless grinders are now equipped with a new balancing apparatus, which is claimed to aid the production of more accurate workpieces and better surface quality. 1 illustr.
B *Chcc Pr.322:.27.3235*

The use of diamond in the automobile industry. L'utilisation du Diamant dans l'industrie automobile

Anon. *La Cote Libre* 1961 (162) p 8 (Aug 30) (In French)

Reviews briefly the development and use of diamond honing to hone relatively soft metals, namely those used in cylinder blocks, *etc.*
B *Agz Chh Nqe.132*

Tool and cutter grinder roundup

Anon. *Cutting Tool Engng* 1961 Vol 13 (9) pp 8-19 (Sep)

Reviews recent development in the tool and cutter grinding industry. 11 illustr.
B *Al Chc Pr*

Swiss machine tools 1961 [Cylindrical grinder]. Schweizerische Werkzeugmaschinen 1961 [Rundschleifmaschine]

H. F. Wegmüller. *Werkst u Betr* 1961 Vol 94 (9) p 667 (Sep) (In German)

The RN 250-Sh is equipped with Deltalimit, an electronic length matching device, for the grinding of paired-workpieces. 1 illustr.

B *Chcl Pr.323:.27.3235*

Swiss machine tools 1961 [Mägerle surface grinders]. Schweizische Werkzeugmaschinen 1961 [Mägerle Flächenschleifmaschinen]

H. F. Wegmüller. *Werkst u Betr* 1961 Vol 94 (9) pp 666-667 (Sep) (In German)

The profile surface grinder FPA is equipped with a completely automatic roller-profiling cycle, which switches off the machine when the correct size is reached. The machine can function as a surface grinder when the profiling equipment is replaced by a diamond applicator. *B* *Chcm Pr.323:.27.3235*

German machine tools at Brussels : Grinding machines [Tool grinding machine]. Deutsche Werkzeugmaschinen in Brüssel : Schleifmaschinen [Werkzeug Schleifmaschine]

W. Eickhoff, H. Moser. *Werkst u Betr* 1961 Vol 94 (9) p 624 (Sep) (In German)

The WU 3 mS tool grinding machine has a swivel mounted grinding head, with an adjustment of 60° to right and left

B *Al Chc Pr.322:.27.3235*

German machine tools at Brussels : Grinding machines [Multimat 200]. Deutsche Werkzeugmaschinen in Brüssel : Schleifmaschinen [Multimat 200]

W. Eickhoff, H. Moser. *Werkst u Betr* 1961 Vol 94 (9) p 588 (Sep) (In German)

The Multimat 200, a centreless grinder, is claimed to be suitable for traverse and plunge-cut grinding. The drive is infinitely variable, and a swivel adjustment may be used to correct grinding and regulating wheels which are out of parallel. 1 illustr.

B *Chcc Prs.322:.27.3235*

German machine tools at Brussels : Grinding machines [Precision grinding machine]. Deutsche Werkzeugmaschinen in Brüssel : Schleifmaschinen [Präzis-Schleifmaschinen]

W. Eickhoff, H. Moser. *Werkst u Betr* 1961 Vol 94 (9) pp 588-589 (Sep) (In German)

Georg Müller Kugellagerfabrik KG has increased its range of precision grinding machines by the introduction of the Type MPS 2, which is universally adjustable, and is claimed to be capable of working to within 1 μm. This degree of accuracy, and even greater, can be achieved in grinding sintered carbide or ceramic tools when diamond grinding wheels are used. 1 illustr.

B *Al Bkc Chc Nv Pr.322:.27.3235/ Al Bl Chc Nv Pr.322:.27.3235*

High speed grinding — a great advance in grinding and polishing technique. Hochtouriges Schleifen — ein grosser Fortschritt in der Schleif- und Polier-Technik

B. Kleinschmidt. *Klepzig Fachberichte* 1961 Vol 69 (7) pp 256-258 (July) (In German)

6 illustr. *B* *Chc Uqfc/Chm Uqfd*

Use of abrasive belts and new applications

D. H. Knapp jun. *Mech Engng* 1961 Vol 83 (9) p 82 (Sep)

B *Pee.1451*

Belgian machine tools 1961 [SA Impéria machines]. Belgische Werkzeugmaschinen [SA Impéria Maschinen]

R. Molle, G. Boitte. *Werkst u Betr* 1961 Vol 94 (9) p 707 (Sep) (In German)

The SA impéria display at Brussels included the universal tool grinding machine M6 AR, and grinding machines for cutter tips, MO 13, MO 14, and MO 15, which, it is claimed, can employ all diamond or sintered grinding wheels. The universal grinder MGAR is claimed to be able to grind tools, as well as to carry out internal- external- and surface grinding.

B *Chc Pr.27.3235*

Making components for the Kopp variable-speed unit

A. W. Astrop. *Machinery, Lond* 1961 Vol 99 (2548) pp 616-623 (Sep 13)

Describes production of the main drive balls. Solid forged balls are first centreless ground on a modified Cincinnati machine, and then drilled, reamed and relieved in the bore on Ward 2C capstan lathes. A succession of grinding operations follows, and superfinishing to 1 to 2 micro-in. is carried out on vertical machines with opposed cast-iron laps. 10 illustr.

B *Ayz Chc Pr*

Portable regrinding equipment saves dismantling

D. A. Parker, C. K. V. Owen. *Mach Lloyd* 1961 Vol 33 (19A) pp 43/46 (Sep 23) (In English, French and German)

The regrinding of large diameter journals *in situ* can be carried out on the master hone external grinding head. An accuracy of 0.001 in., it is said, is normal and can often be bettered. 6 illustr.

B *Ayz Chcz Prw*

Controlled vibration

T. W. Black. *Prod Engng* 1961 Vol 32 (36) pp 193-194 (Sep 4)

Vibratory barrel finishing, once considered something of a novelty, has demonstrated its ability to cut parts-finishing time under production conditions.

B *Chmz Pr Qn Wp*

The grinding of high speed steel tools. Uber das Schleifen von Schnellarbeitsstählen

G. Pahlitzsch, J. Lütgens. *Klepzig Fachberichte* 1961 Vol 69 (7) pp 235-244 (July) (In German)

Report of the Institute of Machine Tools and Machining Technique of the University of Brunswick. The optimal conditions for machining two selected, difficult-to-machine, high-speed steels, and the yield were compared with those for heat-treated and low-alloy tool steel. 23 illustr, 12 ref, 1 table.

B *Al Bfcbd Chc*

Cutter head grinding machine MSJ 80. Messerkopf Schleifmaschine MSJ 80

Anon. *Die Maschine* 1961 Vol 15 (9) p 73 (Sep) (In German)

The MSJ 80 is claimed to be able to grind cutter heads from 100 to 800 mm diameter, with tool steel, high speed steel, or sintered carbide inserts. 1 illustr.

B *Alz Bfcb Chc Pr/Alz Bkc Chc Pr*

A simple special tool for lapping level surfaces on boring machines. Einfaches Sonderwerkzeug zum Läppen ebener Flächen auf Bohrmaschinen

Anon. *Industrieblatt* 1961 Vol 61 (9) pp 604 (Sep) (In German)

B *Az Chd Pg*

German machine tools at Brussels : Grinding machines [Johannsen band grinding and polishing machines]. Deutsche Werkzeugmaschinen in Brüssel : Schleifmaschinen [Johannsen Flächenbandschleif- und Poliermaschinen]

W. Eickhoff, H. Moser. *Werkst u Betr* 1961 Vol 94 (9) p 589 (Sep) (In German)

These two new machines are claimed to be capable of band grinding and polishing sheet metal of ordinary and stainless steel, brass, copper, aluminium, zinc *etc.* Both are equipped with a grinding belt, 300 mm in width. The model BSMM II differs from BSMH 1 in that it also has a 100 mm belt, with which bad patches can be ground, without it being necessary to grind the whole surface. 1 illustr.

B *Bf Chc Pee Pr.322:.27.3235/ Bf Chm Pr.322:.27.3235*

German machine tools at Brussels : Grinding machines [Internal grinding machines]. Deutsche Werkzeugmaschinen in Brüssel : Schleifmaschinen [Innenschleifmaschinen]

W. Eickhoff, H. Moser. *Werkst u Betr* 1961 Vol 94 (9) p 586 (Sep) (In German)

Wotan-Werke GmbH has produced an internal grinding machine, Type Sn 207/13 L, which can deal with long and short workpieces, no adaptation being necessary. Also produced by the same firm is the automatic internal grinding machine, Type Sa 204/5K. 1 illustr.

B *Chcn Pr.322:.27.3235*

German machine tools at Brussels : Grinding machines [Kopp universal copy grinding machine]. Deutsche Werkzeugmaschinen in Brüssel : Schleifmaschinen [Kopp Universal-Kopierschleifmaschine]

W. Eickhoff, H. Moser. *Werkst u Betr* 1961 Vol 94 (9) pp 589-590 (Sep) (In German)

The universal copy-grinding machine UKS 2 is particularly suited to the grinding of workpieces of very hard or hardened material. An automatic dressing device and a compensating device for wear on the grinding wheel are attached. 1 illustr.

B *Chcz Pr.322:.27.3235*

Diamond needle files cut hard metals

Titan Tool Supply Co Inc, 68 Comet Ave, Buffalo 16, NY. *Tool mfg Engr* 1961 Vol 47 (3) p 139 (Sep) ; *Mach Tool Blue Bk* 1961 Vol 56 (9) pp 282-283 (Sep)

These diamond needle files are said to be particularly well suited to sharpening, cutting and dressing hardened steel dies, and cutting carbide and ceramic materials. They have found extensive use in dressing hard nitrited dies for extruding aluminium. They are available in 12 different shapes and as slot files or machine files. They are made in three grits—200/240, fine, for polishing ; 120/160, medium, for general use ; and 80/100, coarse, for rapid material removal. Since there is virtually no wear associated with the use of hard diamond, objectionable dust from bonded abrasive bars is not a problem.

D *Ax Chm Nqcz*

The Machine Tool Show in print : Modler MT 75 barrel-roller centreless grinder

Brit Rep : Selson Machine Tool Co Ltd, Sunbeam Rd, London NW 10. *Metalworking Prod* 1961 Vol 105 (36) pp 107, 109 (Sep 6)

The arrangement of this machine differs from normal centreless grinders in using a spherical control wheel and a work carrier in the form of a cage surrounding the control wheel. Roundness is said to be held to 0.00002 in. to 0.00004 in., and capacity is for rollers up to 1.18 in. diameter with minimum radius of 0.78 in. and maximum radius of 4.7 inches. 2 illustr.

D *Chcc Pr*

7th European Machine Tool Exhibition — Brussels : Lidkopings centreless grinders

Lidkopings Mekaniska Verkstads AB, Lidkoping, Sweden ; Brit Rep : Drummond-Asquith Ltd, King Edward House, New St, Birmingham 2. *Machinery, Lond* 1961 Vol 99 (2546) pp 478-479 (Aug 30)

Grinding wheels up to 26 in. diameter by 14 in. face width can be fitted to the type 5B centreless grinder. Separate nozzles are provided for applying coolant to the truing diamonds.

The No 2B/SP small precision centreless grinder is arranged for advance and withdrawal of the grinding wheel under push-button control. The wheel, it is claimed, can be positioned to an accuracy of 0.00002 of an inch. 1 illustr.

D *Nj Psf Qr:Chcc Pr.27.3235*

7th European Machine Tool Exhibition — Brussels : Fortuna-Werke precision grinding machines

Fortuna-Werke Spezialmaschinenfabrik, AG, Stuttgart-Bad Cannstatt, West Germany, Brit Rep : Vaughan Associates Ltd, 4 Queen St, Curzon St, London W 1. *Machinery, Lond* 1961 Vol 99 (2546) pp 470-472 (Aug 30)

Type KAE 500/1000 AR is a special heavy duty machine for plunge grinding the end journal of a crankshaft using multiple grinding wheels, which are automatically trued by a Finiform profile truing device with a diamond holder slide inclined at an angle of 20°. A Finibalanz attachment which has been developed for cylindrical grinding machines is also incorporated, which enables the wheel to be accurately balanced while mounted on the spindle. Type SIP V is an internal and face grinding machine for finishing very small bores. It is equipped with a high frequency grinding spindle which is said to run at 120,000 revolutions per minute. 2 illustr.

D *Ab Cgf Nj Psf:Chcn Pr.27.3235*

Hauser pivot polishing machines

Henri Hauser Ltd, Bienne, Switzerland. Brit Rep : Wickman Ltd., Coventry. *Machinery, Lond* 1961 Vol 99 (2550) pp 748-749 (Sep 27)

Pivot polishing, as used extensively in the watch-making industry, differs from burnishing in that metal removal is by a solid disk of aluminium oxide, or tungsten carbide. The operation of the type 430 twin-spindle semi-automatic machine made by Henri Hauser Ltd is described. 2 illustr.

D *Az Chmz Pr Tlb.25*

Lidkoping model 2C centreless grinder

Fenter Machine Tools Ltd, 184 Aston Rd, Birmingham 6. *Metalworking Prod* 1961 Vol 105 (37) p 89 (Sep 13)

This machine can be used for through-feed and infeed grinding, and incorporates a profile-copying device for form truing of wheels. It is claimed that the push-button operated feed mechanism can advance the wheel by stages of 0.00002 inch. Special spindles are also available on which the machine can be moved axially for shoulder work controlled, it is said, to 0.0004 inch. 1 illustr.

B *Chcc Pr*

Christen KB 2 edge chamfering machine

Christen & Co Ltd, Berne, Switzerland ; Brit Rep : G. Zwicky (London) Ltd, Zwicky House, 241-247 High Street, London W 3. *Machinery, Lond* 1961 Vol 99 (2548) pp 607-608 (Sep 13)

Chamfers of 45° are normally produced on this machine, but interchangeable guides can be supplied to enable different angles to be obtained. A 6 in. diameter ring-type grinding wheel is employed, and a lever-operated diamond dressing unit is provided. 1 illustr.

B *Cfl Pr:Ab Cg Nj Psf*

News of the industry : electronically-controlled contour grinding machine

EMI Electronics Ltd. *Instrum Pract* 1961 Vol 15 (9) p 1161 (Sep)

An electronically controlled contour grinding machine, which is claimed to work to an accuracy of ±0.0005 in., has been installed at the Royal Aircraft Establishment, Farnborough, for producing templates used in the manufacture of aerofoil sections for aircraft models.
B *Chcz Pr Wpz*

The Machine Tool Show in print : Mico-Collette type A 015 cutter sharpener

Brit Rep : Soag Machine Tools Ltd, 7 Juxon St, London SE 11. *Metalworking Prod* 1961 Vol 105 (36) p 105 (Sep 6)

Twin stations for pendulum working and automatic recycling give rapid sharpening of Fellows type spur and helical gear cutters. Automatic down feed of the grinding wheel may be from 0.0002 to 0.001 in. increments. *D* *Al Chc Pr*

Automatic precision grinding machines

Churchill Machine Tool Co Ltd, Broadheath, Manchester. *Mach Lloyd* 1961 Vol 33 (20A) pp 29-30 (Oct 7) (In English, French & German)

The capabilities, especially the automatic aspects which facilitate incorporation of Churchill grinding machines in automatic manufacture set-ups, are described. 2 illustr. *D* *Chcw Prs*

Duplex disc-brake grinder has balanced feed

F. E. Rowland Co. *Metalworking Prod* 1961 Vol 105 (39) p 76 (Sep 27)

This Duplex grinder for finishing both faces of disk brake hubs simultaneously features a hydro-mechanical device to balance feed rate and pressure between the wheelheads. 2 illustr. *B* *Az Chc Pr*

Hold optimum tool grinds . . . infinitely

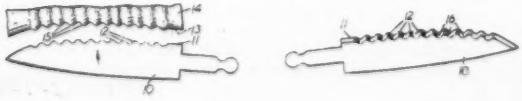
DeVlieg Machine Co, Fair St, Royal Oak, Mich. *Tooling & Prod* 1961 Vol 27 (6) p 51 (Sep)

The Micropoint tool grinder has been specifically designed for grinding cutting tools where the continued reproduction of a proven tool geometry is necessary. Built-in protractors permit control of the relief angle within 0.5°, and tool characteristics, once determined, are recorded for infinite reproduction. 2 illustr.

BP 855,185 (May 14, 1958) **Westall Richardson Ltd**
Improvements in, or relating to, the manufacture of cutlery

In the manufacture of fluted cutlery blades in which a series of flutes are ground into the face of the hardened blade blanks 10, Fig 9, having shaped edges 12 identical to the desired cutting edge, are applied in succession to the periphery of a slowly rotating grinding wheel 14 to form circumferential ribs 15 thereon. After formation of the ribs the wheel is driven at high speed and further blanks are applied with their edges in register with the ribs so that the wheel grinds the flutes 16, Fig 10, and produces cutting edges. The rib formation on the wheel is maintained by the action of each shaped blank. The blanks used for forming the

Fig 9 (left) and 10 (right). BP 855,185.



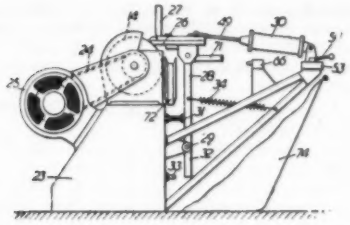
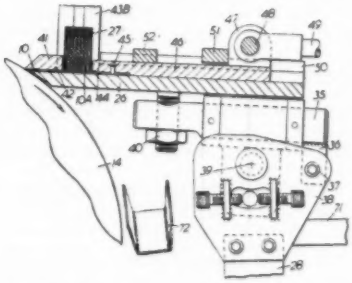


Fig 11 (above) and 12 (below). BP 855,185.



wheel are later used for final grinding. The blanks 10, Fig 11 & 12, are fed from a stack 27 tangentially or obliquely to the motor driven wheel 14 by a pusher plate 44, 46 movable on a carrier 26 which is mounted on arm 28 pivoted at 29 against a spring 34 between stops 31, 33 and is reciprocated by the piston rod 49 of a compressed air cylinder 30. 8 claims, 11 illustr.
H *Az Chc Pri Cgh Psf.545*

BP 861,988 (July 3, 1957) **S. R. Goodwin, Morphy-Richards Ltd**
Improvements relating to abrading and polishing wheels

A form of wheel is provided which is sufficiently yielding and resilient to conform closely to the contour of the object to be treated, the wheel continually presenting a fresh abrasive surface to the object as it is progressively worn away or destroyed by contact with the object. It comprises a number of closely adjacent layers of sheet material in disk or laminated form disposed in planes perpendicular to a shaft and provided with perforations extending through the thickness of the material and distributed over the radial width of the wheel. Polishing or abrading material is fixed to the surface of the sheet material by glue, cement or resin and partly fills the perforations, filling of the latter being completed by a solid or semi-solid lubricant such as tallow, stearate or a grease. The sheet material may be cotton, hemp, jute, flax, paper, cellulose fibre, rayon or nylon and the abrasive media may be silica, emery, garnet, ruby, silicon carbide, aluminium oxide or rouge. 6 claims.
H *Chm Pe Qc.545*

DIAMOND TECHNOLOGY

First published 1942 as " Production Methods for Diamond and Gemstone." The second edition of this book by P. Grodzinski has been revised throughout and considerably enlarged. 840 pages, 4⅜6 illustrations, 94 tables, and indexes. From NAG Press Ltd., 226 Latymer Court, London W 6. 55s, post free.

USP 2,959,474 (Jan 27, 1956) **R. S. Daniels, A. J. Mostello, Union Carbide Corp**

Abrasive bond

Snagging and other grinding wheels in which the abrasive grains are bonded with a phenolaldehyde resin have a high cutting rate, but the surface of the workpiece is not as smooth as that produced by a shellac or rubber bonded wheel. It has been suggested that thermoplastic resins should be incorporated in the bond, but it has been found that usual methods of mixing grains, solvent and resins do not produce wheels of the same strength as wheels prepared from heat-hardenable bonds alone. The problem has been solved by intimately admixing a small amount of a polyvinyl alkyl ether resin of reduced viscosity with a heat-hardenable, phenol-aldehyde, acid-catalyzed resin to form a binder for, say, an abrasive wheel containing, as an abrasive, fused aluminous oxide, silicon carbide, *etc* cold moulded and then baked or hot pressed by known procedure 27 claims, no illustr. Ref cited : 3 USP ; 1 BP.

J *Ab Cs Urb.545*

USP 2,960,392 (Nov 5, 1958) **G. L. Bibbins, Norton Co**

Metal bonded grinding wheel

The bond is prepared from metal and glass fibres instead of from metal and/or glass powder. The advantage is the strong tendency of the fibres to interlock and to align themselves perpendicularly to the direction of pressing. There is a self-dressing action which permits free cutting without or with little sacrifice of life. A peripheral-type diamond wheel is conventionally pressed from the sides. The aligning tendency of the fibres causes them to be oriented parallel to the direction of cutting, for example in electro-erosive grinding, with rapid and effective erosion of parallel paths in short lengths. The matrix is thus frequently interrupted by short parallel areas which effectively minimize smearing and loading. In electrolytic grinding, a wheel matrix composed of metal and ceramic has a sufficiently low conductivity for being electrically conductive without provoking arcing. 10 claims, no illustr. Ref cited : 4 USP.

J *Nv Urc.545/Pe Urc.545*

USP 2,961,908 **H. F. -M. Villalobos** (Sep 4, 1954—Sweden)

Microtome

The microtome is designed for cutting undistorted and unaltered sections of biological tissues, metals and all other substances in solid or semi-liquid state in series of constant thickness from 100 μ (0.1 mm) down to 0.001 μ at a rate of 1 to several hundreds per second. A motor-driven rotor is journalled in V-bearings, a cutting tool is mounted adjustably in front of the rotor and at least one holder for material to be cut projects radially from the rotor against the cutting tool. The holder is fed onto the cutting tool by thermal expansion. A V-bearing has the advantage that a little wear is of no importance. It can easily be machined to the required degree of precision. The cutting edge is preferably ground on a diamond to a sharpness of 2-50 AU (Angstrom units) by a special process using ultrafine diamond, diamantine or aluminium oxide powder of a particle size of 0.001-0.005 micron. An apparatus for carrying out the polishing process is represented in Fig 13. The polishing disk 48 may be rotated at up to 400,000 rev/min. The work feed may be effected by heating a tubular rod carrying the workpiece or by cooling down, especially in cases of cutting materials, liquid at normal temperature. The rod then expands as its temperature slowly rises. In such cases the temperature may be as low as -250° C., while the room temp is kept at -15° C. 2 claims, 4 illustr. Ref cited : 6 USP ; 1 Austrian P.

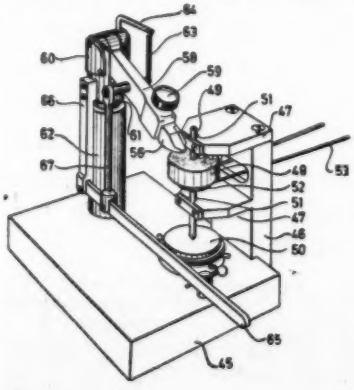


Fig 13. USP 2,961,908.

J *Nfn.545/Pdm.545*

USP 2,962,840 (Sep 19, 1957) **C. H. Werth, Hoern & Dilts of British Machine Co**

Grinding apparatus

The specification describes in particular a sizing apparatus for automatically interrupting the radial feed of the tool at predetermined size and automatically withdrawing the tool entirely when the actual finish size is reached. As shown in Figs 14 and 15, a pair of

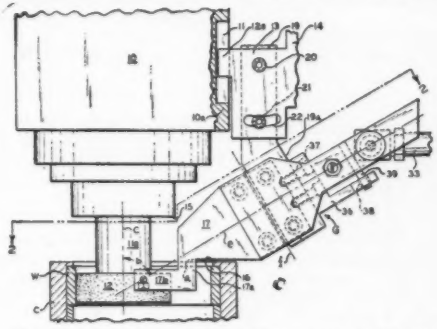
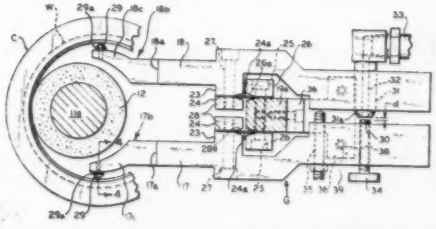


Fig 14 (above) and 15 (below). USP 2,962,840.



feeler arms 17 and 18 project adjustably from bracket 13. Each arm has an inwardly extending section 23, and thin resilient spring strips secure the arms to the lower end 19a of support bar 19 so that the feeler arms are always forced outward to contact their diamond tipped points 29 with the bore of workpiece W. The rear ends of feeler arms 17, 18 close through screw 34a nozzle 32 after reducing gap d to zero thus increasing the (air) pressure in system 33 to interrupt the feed of the grinding wheel 12. 11 claims, 6 illustr. Ref cited : 3 USP ; period : 1956.

J *Chc Pr Psfz.545*

USP 2,964,886 **S. Messerschmidt** (Jan 10, 1957—Germany)

Ball grinding machines

The machine belongs to the class in which the balls are introduced between two superimposed disks, one of which has guide grooves. In order to cause a repeated change of movement of the balls, and increase the cutting speed, an upper ceramic grinding disk is co-ordinated in such a manner that it co-operates with the lower grooved rotating disk on a portion of the path over which the balls travel. Fig 16 and 17 show

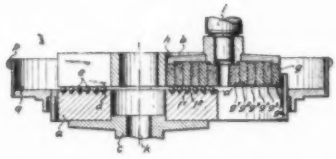
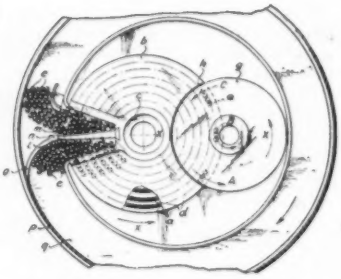


Fig 16 (above)



and 17 (below). USP 2,964,886.

the arrangement of rotating and grooved disk under stationary upper disk *b*. Ceramic grinding disk *g* projects into circular recess *h* in disk b. The grinding rings g^1, g^2, g^3, g^4, g^5, g^6 are of different hardnesses, changing according to their diameter and thus to their working speed so that the grinding effect is always the same. The balls are gripped in a three-point grip and, so-to-speak, rolled flat under pressure and then ground. Expensive preliminary rough grinding or filing of the balls hitherto customary can be dispensed with. 14 claims, 7 illustr. Ref cited : 4 USP ; 1 GP.

J *Ayz Chc Pr.545*

USP 2,966,722 (Nov 5, 1957) **E. H. Hull, A. J. Nerad, General Electric Co**

Irregular surface diamond burnishing tool

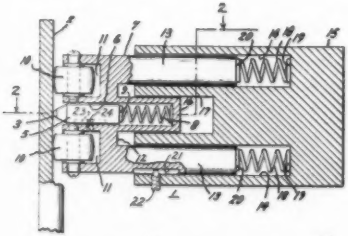
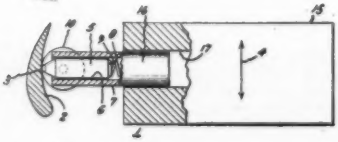


Fig 18 (above)



and 19 (below). USP 2,966,722.

Burnishing produces a cold working of a thin surface section, thus increasing the strength of the surface. A burnished surface is desirable for extremely high speed objects (missiles, interplanetary vechiles), which generally incorporate a nose cone to be particularly smooth for reduced friction, hard enough to withstand abrasion, strong enough to maintain its normal physical characteristics at elevated temperature. The same problems are encountered in blades for turbo machinery. The tool 1 is shown in Fig 18 and 19 burnishing a turbine blade 2. Diamond 3, preferably with a spherical tip, is set between sprung guiding rollers 10, itself under pressure of spring 8. The tool may be set in a lathe or a shaper, reciprocating as indicated by arrows 4. 2 claims, 2 illustr. Ref cited : 5 USP, 2 BP.

J *Chmz Nz.545*

USP 2,966,766 (July 25, 1958) **J. V. Ronaldson, R. C. Hollingworth**

Tool for the abrasive treatment of the interior of hollow bodies

The tool is designed for grinding, cleaning, fettling, cutting, scoring, *etc* of internal surfaces, in particular of tubes. It comprises a head to be introduced into the hollow body. The head carries a number, *eg* three, of abrasive elements brought into contact with the walls of the hollow body (tube) by centrifugal force under yielding pressure. The abrasive elements may contain suitable abrasive, grits of silicon carbide, aluminium oxide, *etc*. They may also be of box wood for use with diamond paste, or diamond impregnated metal rolls. They may also be felt faced plastic, wood or metal disks for polishing purposes. 4 claims, 7 illustr. Ref cited : 5 USP.

J *Ag Chcn Pe.545*

USP 2,967,380 **L. G. Damgaard, H. Struers,** (Apr 22, 1958—Denmark) **Chemiske Laboratorium**

Grinding or polishing apparatus

When polishing samples, for example for metal'ography, it is essential that irregularities in the polishing disk do not form traces in the surface of the sample, and it is further desirable to obtain uniform wear of the disk. Finally, attacking the surface of the sample always in the same direction should be avoided. In order to overcome certain complications of previous designs, and to have the possibility of selecting a suitable uniform speed, a liquid friction brake is interposed between sample holder and stationary part of the apparatus. The apparatus has a grinding disk mounted for rotation about a first axis, a sample holder mounted for free rotation about a second axis parallel to the first axis and a brake which is formed of two co-axial members, with a gap between them filled with braking liquid. One of the members is connected to the sample holder, the other member being connected to the frame of the apparatus. 4 claims, 7 illustr. Ref citted : 3 USP.

J *Chc Psc.545/Chm Psc.545*

MACHINING PROCESSES AND DEVELOPMENTS

A new technique : ultrasonic micro-deburring. Une nouvelle technique : le micro-ébavurage par ultrasons

Anon. *Eurotec* 1961 (23) p 6 (Aug) (In French)

Micro-deburring of gears and other parts uses ultrasonically agitated abrasive slurry. 2 illustr.

B *Ad Chtz Rdc:Qnf*

Investigation into the elimination of grinding erosion, and the electro-polishing of case-hardened gear wheels. Versuch zur Behebung der Schleifanfressungen und die Anwendung der Elektropolierung von zementiertgehärteten Zahnrädern

Anon. *Industrieblatt* 1961 Vol 61 (9) pp 578-579 (Sep) (In German)

1 illustr, 1 table. *B* *Adz Chc.21*

The machining of materials using focussed electron-beams, Materialbearbeitung durch fokussierte Elektronenstrahlen

Anon. *Silikattechnik* 1961 (5) p 206 (May) (In German)

Boring and cutting, it is said, can be carried out with great cleanness and precision using accurately focussed electron-beams. *B* *B Ceqj Cy Wcmc*

Twin electron beams drill 600 jewels an hour

Zeiss, Jena, Germany; Brit Rep: Degenhardt & Co Ltd, 6 Cavendish Square, London W 1. *Metalworking Prod* 1961 Vol 105 (38) pp 65-66 (Sep 20)

Zeiss have developed, as a true production shop tool, a fully automatic electron beam driller, which is claimed to drill bearing jewels at a rate of 600 an hour. Twin beams are used, one to heat, and one to cut. 4 illustr. *B* *Bb Cfbm Prs*

Ultrasonics applied to surface grinding. Les ultra-sons appliqués à la rectification plane

H. W. Bredin. *Mach Mod* 1961 Vol 55 (630) pp 38-40 (Sep) (In French)

Results of the first practical industrial application of ultrasonic energy to a classic grinding machine with tangential grinding wheel, by means of a sprinkling liquid. Among the advantages claimed are increased cutting capacity, elimination of clogging, lower grinding and heating stresses, and improved surface finishes. 4 illustr. *B* *Chcm.1331*

Electrolytic machining process

Battelle Memorial Institute, Columbus 1, Ohio. *Electrolytic Mach* 1960 pp 15-16 (Dec); *SIS Dig* 1961 Vol 2 (8/9) p 19 (Sep)

A process for high-speed metal removal suitable for hard and tough alloys has been developed. A direct current passes between the workpiece and an electrolyte, removing electrons from the workpiece and converting surface atoms into positive ions that dissolve into the electrolyte. The process is independent of the hardness of the metal. 1 illustr.

B *Ba Ceqh.1456*

Vibration mills and vibration milling

H. E. Rose, R. M. E. Sullivan. *Engr, Lond* 1961 Vol 212 (5508) p 271 (Aug 18)

Book, Constable & Co Ltd, 1961. Price 25s.

There are chapters on grinding rate, power requirements, efficiency and design considerations.

[Not in library of Industrial Diamond Information Bureau]. *D* *Cff Qn.52*

The effect on cutting of ultrasonic vibration in sharpening of tools

A. A. Voronin, A. I. Markov, M. A. Shcherbak. *Machines & Tooling* 1961 Vol 32 (2) pp 15-17 (Original in Russian)

7 illustr. *B* *Al Chc Qnf Uqg*

Electric-abrasive machining of parts in the manufacture of instruments

N. N. Gusev, E. A. Kazatsev. *Priborostroenie* 1960 (11) pp 22-24 (Nov); *Library of Congress Mthly Index Russ Access* 1961 Vol 13 (11) p 3455 (Feb) (In Russian)

D *Az Chcr*

Electrolytic grinding with cup wheels. Rectification electrolytique avec meules boisseau

R. R. Cole. *Mach Mod* 1961 Vol 55 (630) pp 31-32 (Sep) (In French)

All electrolytic truing or grinding processes in present use utilize diamond grinding wheels with a metallic bond, which would wear very slowly. This study attempts to determine what is the exact role of electrolysis, and of abrasion, and the influence of the current used. 4 illustr.

B *Chcr Nv Urc.21*

New range of spark-erosion machines

Solar Weld Languepin Ltd, Fulledge Works, Burnley, Lancs. *Brit engng transp* 1961 Vol 43 (9) p 292 (Apr)

The Seleromat A has an erosion head mounted on an articulated arm which can be swung away to give uninterrupted vertical access over the whole area of the worktable; the Seleromat B is similar but has its erosion head mounted on co-ordinate slides which permit accurate location of electrodes over any station of the workpiece area, and the Seleromic is a bench-mounted unit said to possess several refinements not usually found in a machine of like size. A table shows the capabilities of the first two machines, which range from roughing at 1,000 mm^2/min with a tolerance of 0.004 in. to superfinish at 2 mm^2/min with a tolerance of 0.0003 inches. 1 table, 3 illustr.

D *Ceqmb Pr*

The Machine Tool Show in print: May M 1000 EL electrolytic cutter grinder

Rohde & Doerrenberg; Brit Rep: Kimbell Machine Tools Ltd, 4 South Lambeth Place, London SW 8. *Metalworking Prod* 1961 Vol 105 (36) p 102 (Sep 6)

The advantages of electrolytic grinding of inserted-blade cutters are stated to be: better surface finish of the cutting faces, less wheel wear, shorter grinding time, and the ability to rough and finish in the same operation, which has not been previously possible with carbides. 1 illustr. *D* *Alcz Chcr Pr*

The advantages of vibratory finishing

Anon. *Machinery, Lond* 1961 Vol 99 (2549) pp 651, 697 (Sep 20)

B *Chm Qn*

Developments in the application of ultrasonic vibration

Anon. *Machinery, Lond* 1961 Vol 99 (2548) pp 591, 643 (Sep 13)

B *Qn.1331.21*

Electric spark machining of materials

Anon. *Library of Congress Mthly Index Russ Access* 1961 Vol 13 (11) p 3361 (Feb) (In Russian)

Book, Akademiia Nauk SSSR, Moscow, 1960, 247 pp. [Not in library of Industrial Diamond Information Bureau]. *D* *B Ceqm.1456.33.52*

The position and the direction of development of electro-erosive finishing of metals, and the progress towards automation [in the USSR]. Stand und Entwicklungsrichtung der elektroerosiven Bearbeitung von Metallen und die Wege ihrer Automatisierung

Anon. *Eurotec* 1961 (23) p 25 (Aug) (In German)

B *Bf Ceqmb Prs.132.33*

Electro-erosion machining of metals

A. L Livshits. Book 115 pp. 1960. Butterworths, London. *Battelle tech rev abstr* 1961 Vol 10 (8) col 798 (Aug)

D *Bf Ceqn*

BP 856,340 (Nov 27, 1956) **Sparcatron Ltd**
Improvements in apparatus for working electrically conductive materials by electric erosion

The electrode is mounted for rotation about an axis 4 and comprises cylindrical components 1, 2, 6, which may be of brass, separated from each other by an oblique layer 3, 5, of insulating material. Each component is connected through a rectifier 14, 15, 16, to a different phase of an alternating current supply.

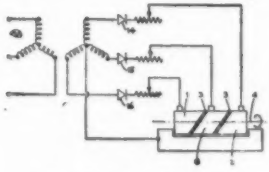


Fig 20. BP 856,340.

An electrolytic or dielectric bathing fluid is used during erosion. In other illustrations the electrode has two components only and is formed by machining a sandwich consisting of two brass disks with an intervening layer of insulating material, or the electrode is of rectangular shape and is oscillated during erosion. 7 claims, 4 illustr. *H* *Ceqm Pt.545*

BP 856,983 (June 18, 1958) **Rolls Royce Ltd**
Improvements in the formation of holes by spark erosion

In order to interconnect cooling passages 18, 19 in a gas turbine blade, transverse holes are formed in the wall of passage 18 by spark erosion using an electrode 15 with a longitudinal portion 16 and projections 17.

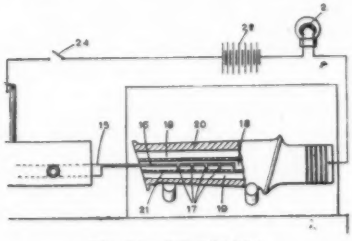


Fig 21. BP 856,983.

For initial setting of the electrode, an indicator lamp 23 and a battery 22 are used to ensure that the electrode is out of contact with the wall of passage 18. A separate d.c. supply is used for the erosion during which the replaceable copper or brass electrode 15 is fed downwardly and is vibrated longitudinally by an electromagnetic vibrator. Dielectric fluid is fed through a capilliary bore in the electrode and the operation may take place in a bath of dielectric fluid such as paraffin. The blade is mounted on a table capable of horizontal movement in two directions. 7 claims, 2 illustr.
H *Az Ceqmb 1456.545*

BP 857,730 **Nassovia Maschinenfabrik Hanns** (Aug 13, 1957—Germany) **Frickert GmbH**
Improvements in spark-erosion machines

The apparatus has a worktable 2 rigidly secured by columns 3 to a horizontally adjustable tank 1 and surrounded by a dielectric fluid container 7 movable vertically within the tank. The container 7 is moved by a screw 10 protected from the dielectric fluid by bellows 11, 12. The fluid discharges from the container 7

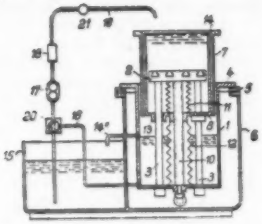


Fig. 22. BP 857,730.

through point 13 into tank 1, is withdrawn therefrom through pipe 16 by pump 17 and recirculated to the container through filter 18, valve 21 and pipe 19. A three-way valve 20 enables the pump to draw directly from a main reservoir 15. In another illustration the worktable makes a fluid seal within the container 7 and the fluid is discharged through a duct in a single column supporting the worktable. A number of vertical screws are used for moving the container. 7 claims, 2 illustr. *H* *Ceqmb Pr.545*

BP 860,609 (May 28, 1958) **Rolls Royce Ltd**
Improvements in the drilling of holes by spark erosion

In drilling longitudinally arcuate holes for cooling or heating fluid in the root of a turbine blade, a curved electrode 26, Fig 23 and 25, is vibrated during erosion and the blade 15 is carried by a resilient mounting so that it can vibrate under the influence of the drill. The blade 15 is mounted on a face plate 14 driven by an air motor 16 through gearing 17, 19 and a resilient

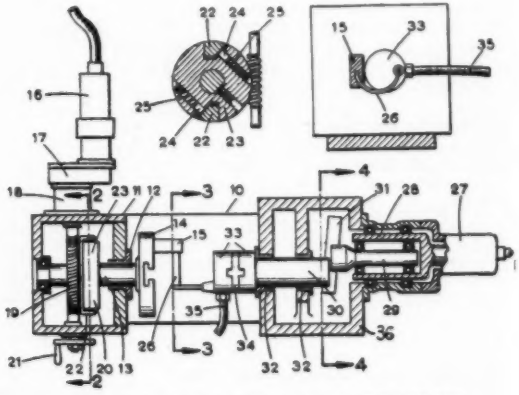


Fig 23 (below) and 24, 25, (above). BP 860,609.

coupling 20, Fig 24, comprising a driving member 22 which acts through spring loaded plungers 24 on a driven member 23 and thus permits limited oscillation of the face plate about its axis simultaneously with its rotation. The electrode 26 is adjustably mounted on a housing 33 carried by a shaft 30 which is oscillated about its axis through eccentric members 28, 29 and lever 31. Liquid electrolyte is supplied by a pipe 35 to the electrode. 6 claims, 4 illustr.
H *Ceqmb.4456.545*

LITERATURE REQUESTS
Please quote the page number of the journal which contains the original reference, and the author and title of the article, in all cases.

BP 860,118 **Agie AG für Industrielle Elektronik** (Mar 19, 1956—Switzerland)

Method and arrangement for detaching material by spark erosion

In spark machining the amount of material detached from the electrode is greater or smaller than that removed from the workpiece, depending whether the electrode constitutes the anode or the cathode. In Fig 27

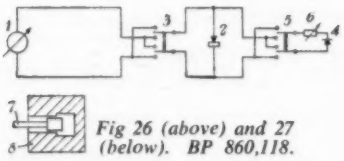


Fig 26 (above) and 27 (below). BP 860,118.

an electrode 7 is used to bore a stepped hole in a blank 8 by positively and negatively connecting the electrode in turn to form the neck and blind end portions respectively. When using alternating current supply, accuracy in the cylindrical bore is obtained by increasingly suppressing the half waves of one polarity as the electrode advances in the workpiece so as to continuously widen the spark gaps and thus compensate for burning off at the electrode. The electric circuit Fig 26 comprises a variable voltage and frequency generator 1, polarity reversing switches 3, 5, and a half wave rectifier 4, connected in series with a resistance 6, which is automatically adjusted to vary the amount of wave suppression. The spark gap is illustrated at 2. 10 claims, 4 illustr.

H *Ceqmb.1456.545*

USP 2,962,577 (Feb 9, 1959) **R. S. Webb, Elox Corp**

Electrical discharge machining method

It has been determined that narrowing of the area on the electrode face from which the discharge takes place will improve the machining rate. If "fanning out" is prevented, further improvement is obtained. An electrode material having an ionic density greater than 0.4 and a coolant of a high methyl group density satisfy such conditions. A sintered product comprising 78% copper and 22% carbon ("Carbone CG4" of the Carbone Corp) and a di-methyl siloxane silicone oil of a kinematic viscosity of 20 to 50 centistokes (from the Dow-Corning Corp) are suitable. 3 claims, no illustr. Ref cited : 2 USP.

J *Ceqm Pr.545|Ceqmb Pr.545|Ceqn Pr.545*

FP 1,233,689 (May 6, 1959) **J. Gastaud**

Machine for the spark machining of refractory steel disks for the manufacture of glass fibres. Machine pour l'usinage par étincelage de disques destinés à la fabrication des fibres de verre

The machine which is shown partly in cross-section in Fig 28 may be used for providing holes in the vertical peripheral flange of a disk 40. It consists of a cylindrical tank 23 rotatable on ball bearings 11 on a base plate 5 by bevel gearing 13 actuated by a handle 15. The tank is locked in any desired position by a conical pin 18 engageable in corresponding holes in the periphery of the tank bottom plate 9 and operable by a cam 19 actuated by a pair of levers such as 21. The disk 40 is secured on a circular plate 41 supported on a circular slideway 44 mounted on the base plate. A series of electrode holders is disposed around the tank periphery and carry a number of tungsten or copper electrodes positioned to work horizontally, vertically or at an angle. Each holder is actuated by an assembly incorporating a guiding device 28, 29 and a cylinder and piston 30, 31. Travel of the holders is limited by

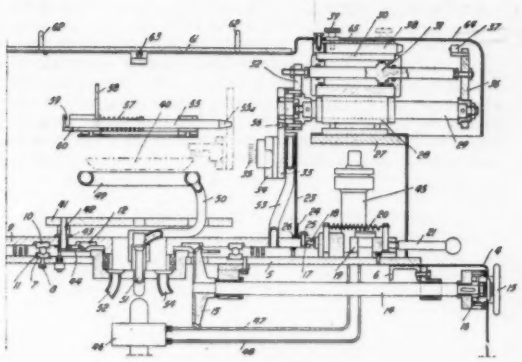


Fig 28. FP 1,233,689.

an adjustable stop 38 engaging a micro switch 37. Alternatively, one electrode holder controls the travel of all the holders and may be provided with a conical hole 56 for engagement with a stop 55 mounted in the tank. Admission of fluid in the cylinders 30 is regulated by an hydro-electric servo device 45 co-operating through conduits 47, 48 with a distributing chamber 46 connected to the cylinders and imparting to the fluid impulses proportional to the discharge voltage so as to oscillate the electrodes and permit removal of metallic particles resulting from the machining operation. 9 claims, 3 illustr.

H *Az Bfcbz Ceqm Pr.545*

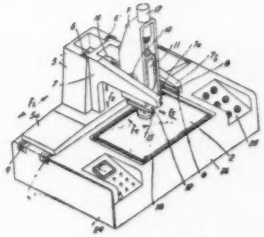


Fig 29. FP 1,235,415.

FP 1,235,415 (May 28, 1959) **J. Gastaud**

Machine for sharpening and cutting by electro erosion. Machine à pointer et à tracer pour électro-érosion

The machine is characterised by electrodes secured in a holder capable of movement in all directions with respect to a fixed worktable. As shown in Fig 29, the electrode holder 13 is secured in a member 11 pivotally mounted in a carriage 9 which is capable of transverse movement in slides 8 in the arms of a jib 7. The jib is movable vertically in slides in a housing 5 which itself can move horizontally in slides 4, 4' in the machine bedplate. The worktable 2 is supported by the bedplate and is surrounded by a retractable tank 18 containing dielectric liquid. The various moving parts are operated by hydraulic jacks which are automatically controlled by electronic means. 7 claims, 3 illustr.

H *Ceqm Pr.545*

LITERATURE REQUESTS

Please quote the page number of the journal which contains the original reference, and the author and title of the article, in all cases.

FP 1,237,614 (Dec 22, 1958—Germany) **R. Sattler, H. Schierholt, H. J. Schulz, Deutsche Edelstahlwerke AG Allgemeine Elektrizitäts Gesellschaft**

Method and device for flooding the space between electrode and workpiece during machining of workpieces on machines. Procédé et dispositif pour irriguer l'intervalle d'usinage entre l'electrode et la pièce sur les machines d'érosion par étincelage

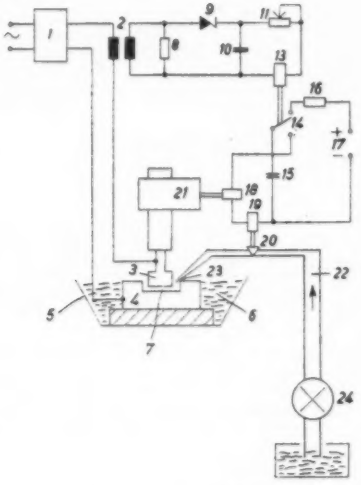


Fig 30. FP 1,237,614.

For efficient operation the spark gap between the electrode and the workpiece must be kept free of metal particles which are removed during erosion and tend to clog the gap. The present method consists in momentarily increasing the supply of dielectric fluid to the spark gap to clear the particles away by means of an electric measuring device which operates in response to the reduction of spark recurrence frequency below a certain value, the reduction being proportional to the increase in spark gap clogging. The device illustrated comprises a transformer 2 in the discharge circuit whose secondary winding is connected through a diode 9 to a condenser 10 which actuates a relay 13 when the time interval between electric discharges increases, *ie* when the gap between the electrode 3 and the workpiece 4 becomes clogged. The relay 13 operates a switch 14 whereby a condenser 15 discharges into relays 18, 19, the former operating the advance mechanism 21 to retract the electrode from the workpiece and the latter actuating a magnetic valve 20 to allow additional dielectric fluid to be forced under pressure through a conduit 22 by means of a pump 24 and to discharge between the electrode and the workpiece to clean the gap. 4 claims, 1 illustr.

H *Ceqmb Psc Ptc.1456.545*

DIAMOND TECHNOLOGY

First published 1942 as "Production Methods for Diamond and Gemstone." The second edition of this book by P. Grodzinski has been revised throughout and considerably enlarged. 840 pages, 486 illustrations, 94 tables, and indexes. From NAG Press Ltd., 226 Latymer Court, London W 6. 55s 0d, post free.

PRODUCTION, GRADING & RECOVERY OF ABRASIVE PARTICLES

Industrial diamonds : new methods. Industriediamant : nieuwe metodes

Anon. *Belg Diamantnijverheid* 1961 Vol 43 (9) pp 11, 13 (Sep) (In Flemish)

SND, 'selected natural diamonds' are claimed to be more economical, longer lasting, and to possess greater abrasive capabilities. *B* *Fc.361*

Applying diamond coatings

N. A. Matthews. *Tool mfg Engr* 1961 Vol 47 (3) pp 185-186 (Sep)

Abstract of paper presented at 16th Annual Convention of the Industrial Diamond Association of America, entitled 'New applications for diamond'.

Some applications of this technique, whereby diamond particles can be deposited in the range of 0.0005 to 0.0010 in. thick, are in plug gauges, in textile guides for handling nylon fibres and in special purpose knives.

Diamonds in honing machines, especially in large, multi-spindle machines, are becoming increasingly important, it is stated. *D* *Nw Qc*

Product briefs ; Grinding wheel

Simonds Abrasive Co, Tacony & Fraley Sts., Philadelphia 37, Pa. *Purchasing Week* 1961 Vol 4 (39) p 36 (Sep 25)

A grinding wheel with synthetic ruby grain of specially processed crystalline aluminium oxide combines friability and toughness, to a degree resulting, it is claimed, in superior form holding with cooler, faster grinding than conventional grains and bonds. *D* *Pe.21*

TOOL PRODUCTION

Annual review of specialist fields of technology. Fachgebiete der Technik in Jahresübersichten

Anon. *Z Ver Dtsch Ing* 1961 Vol 103 (25) pp 1286-1291 (Sep 1) (In German)

The development during the past year of gear cutting, grinding and electro-erosion machines is discussed, a separate article being devoted to each. *B* *Ceg Pr.532*

Hydraulic tool grinding machine. Hydraulische Werkzeugschärfmaschine

Anon. *Die Maschine* 1961 Vol 15 (9) p 73 (Sep) (In German)

The Haro No 400 is an automatic hydraulic machine for sharpening case-hardened cutter heads up to 400 mm in diameter and tools with straight or oblique toothing (with the exception of spirals) up to 450 mm in length. 1 illustr. *B* *Al Chc Pr*

Mining miscellany

Anon. *Min J* 1961 Vol 257 (6579) p 295 (Sep 22)

Barclays Bank DCO reports that a new factory has been opened in Salisbury by Rhodesian Diamond and Carbide Products Ltd to produce tungsten carbide drill rods, detachable bits, coal picks and borers and all types of tungsten carbide tools and diamond crowns for the mining industry. *D* *Bn Cfb Pd.363/Cb.25:Nhg.363*

Sintered carbide turning tools without clamps or brazing. Hartmetall Drehwerkzeuge ohne Klemmen oder Auflöten

Anon. *Fertigungstechnik u Betrieb* 1961 Vol 11 (8) p 540 (Aug) (In German)

This method, by which a cylindrical sintered carbide insert is shrunk into a boring in the tool holder, is claimed to be very economical and practicable in small workshops. 2 illustr. *B* *Ceqb Pdcb*

Plastic materials in the manufacture of machine tools and machine body parts

V. S. Korsakov, V. N. Lymzin. *Plast massy* 1960 (6) pp 37-42; *Library of Congress Mthly Index Russ Access* 1961 Vol 13 (11) p 3515 (Feb) (In Russian)
D *Pr Qc Ss*

High production equipment for machine tools

A. Kh. Druz'. *Library of Congress Mthly Index Russ Access* 1961 Vol 13 (11) p 3362 (Feb) (In Russian)

Book, Gos nauchno-tekhn izd-vo mashinostroit. lit-ry, Moscow, 1960, 64 pp.
[Not in library of Industrial Diamond Information Bureau]. *D* *Pr Qc.33.52*

Some tool research comments. Aus der Praxis der Werkzeugforschung

E. Barz. *Z Ver Dtsch Ing* 1961 Vol 103 (25) pp 1282-1285 (Sep 1) (In German)

Important problems of tool research include investigation of possibilities for the optimal design, investigation into production and application, and ascertaining wear resistance. For these purposes numerous testing methods and apparatus have been developed. 10 illustr.
B *Pd.131*

Production of Newbould segmental saws

Sanderson Bros & Newbould Ltd, Attercliffe Steel Works, Sheffield, 9. *Machinery, Lond* 1961 Vol 99 (2547) pp 575-577 (Sep 6)

Radii and slots are cut in four workpieces at a time on a Wyssbrod hydraulically-operated profile milling machine, the sides of the segments are subsequently ground on a Snow duplex machine, fixing holes are drilled on multi and single spindle Boley machines, and the teeth on the segments are form-ground on a battery of Heller machines. 3 illustr.
D *Alf Chc Pr*

BP 856,252 (Jan 25, 1956) **C. H. Booth**

Improvements in the formation or sharpening of teeth on multi-tooth tools

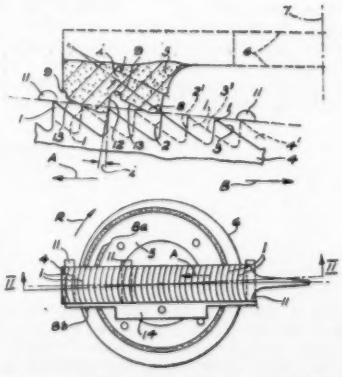


Fig 31 (above) and 32 (below). BP 856,252.

The teeth of a multi-tooth tool blank, such as a file, a saw, or a milling cutter, are sharpened by engaging the cutting edge or surface of the blank at one end only of a diameter of an abrasive structure 8 formed as a spiral or scroll which is rotated in its own plane and has a pitch equal to, or an integral multiple of, that of the teeth of the blank. The blank is traversed past a disk carrying the scroll, which may be of abrasive or plain metal to which a grinding paste or lapping powder is fed in the direction of arrow A so that the leading faces 2 of the teeth are ground by a flank 12 of the abrasive structure. The clearance faces 3 of the teeth are ground either by reversing the direction of rotation of the tool or by traversing the blank past the tool in the same direction while maintaining the faces 3 in contact with a flank 13. 13 claims, 14 illustr.
H Al *Chc Pr.545*

BP 856,662 **E. Bisterfield, Bisterfield & Stolting**
(May 13; Oct 3, 1957—Germany)

Improvements in or relating to grinding wheels

In known grinding wheels of great width the cutting rate is limited by inefficient removal of the ground-away material due to the low porosity of the wheel.

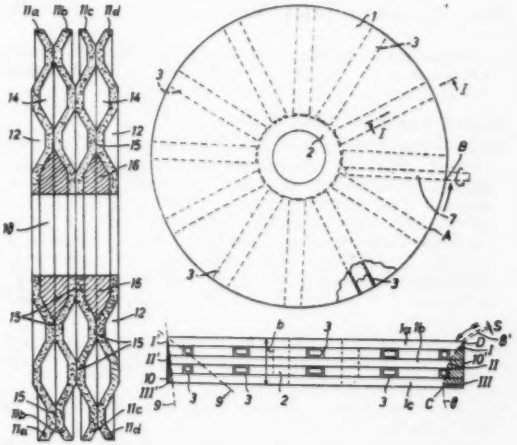


Fig 33 (above), 34 (below) and 35 (left). BP 856,662.

Highly porous grinding wheels have been developed but these have a high rate of wear. The grinding wheels described consist of a number of thin grinding disks which are rigidly secured to one another to form a unitary structure with chip receiving cavities extending between the grinding edges of the disks. The disks are made of abrasive grains of corundum, silicon, or boron carbide bonded ceramically or by means of a thermo-setting or thermoplastic resin. In Figs 33 and 34 the disks 1a, 1b, 1c are mounted on a hub 2 and spaced apart by paper or metallic tubes 3 connected to the disks by an adhesive. Alternately, the disks are separated by metallic or plastic honeycombed or corrugated plates. Radially extruding ribs may also be moulded integrally with the disks and cemented together. In Fig 35, the disks have a zig-zag profile in cross-section forming depressions 12 and projections 15, the latter being cemented to one another. 13 claims, 9 illustr.
H *Nv.21.545/Pe.21.545*

LITERATURE REQUESTS
Please quote the page number of the journal which contains the original reference, and the author and title of the article, in all cases.

POWDER METALLURGY

2nd International Powder Metallurgy Conference, Eisenach 1961. II. Internationale Pulvermetallurgische Tagung in Eisenach 1961

Cerovsky. Technik, Berl 1961 Vol 16 (9) pp 658-660 (Sep)
B *Vwlb.231.322*

Don't overlook powdered metal parts

Anon. *Prod Engng* 1961 Vol 32 (36) pp 65-67 (Sep 4)
Suggestions for the design of powdered metal parts. 11 illustr. *B* *Az Bfy Qt.256*

MISCELLANEOUS

Seen at Brussels : Some close-up views of exhibits at the 7th European Machine Tool Exhibition

Anon. *Machinery, Lond* 1961 Vol 99 (2551) pp 817-820 (Oct 4)
Some interesting details of several machines are shown. 12 illustr. *D* *Pr.27.3235*

Russian tool deals boost German sales

Anon. *Metalworking Prod* 1961 Vol 105 (38) p 15 (Sep 20)
Faced with the alternative of buying Soviet-made equipment or losing substantial export orders to Russia, several West German manufacturers accepted delivery of machine tools assembled in Russia, and the quality of work they turned out has been equally as good as comparable US and German machines. Amongst the examples given are surface, cylindrical and centreless grinders. *B* *Pr.33:.251.322*

New applications, novel effects in surface treatment. Neue Anwendungen, neuartige Effekte bei der Oberflächenbehandlung

P. Schumann. *Klepzig Fachberichte* 1961 Vol 69 (7) pp 258-259 (July) (In German)
Scotch-Brite, a non-metallic nylon-like fibrous substance, in which abrasive material is embedded, is described, and the manner in which it is used most efficiently is discussed. 2 illustr.
B *Bp.1451*

Fundamental observations on the applicability of the polarising microscope to material testing. Grundsätzliches zur Anwendbarkeit des Polarisationsmikroskops in der Materialprüfung

H. Schumann. *Silikattechnik* 1961 (6) pp 255-257 (June) (In German)
The author reviews briefly the uses and methods of microscopic examination of so-called precious stones used in industry. 13 ref.
B *Bb Cy Wcmc*

Seventh European machine tool exhibition-Brussels 3-12 Sept, 1961 : the French display. Septièmè exposition européene de la machine-outil-Bruxelles 3-12 Sept 1961 : la participation française

Anon. *Mach-outil franç* 1961 Vol 26 (168) pp 119-221 (Aug-Sep) (In French)
The article lists the French machine tools displayed at Brussels and gives a brief description of each. Illustrated. *B* *Pr.3215:.27.3235*

BP 840,781 (Jan 18, 1957—USA) **American Optical Co**

Replaceable facings for surfacing tools and method of forming such facings

The facing consists of a sheet of foraminous material (thin steel wire mesh) of loosely woven wire. The facing may either form part of the sheet or a separate clamp may be used for securing the facing to the tool. Or, an adhesive may be sprayed on the back of the facing and then flocked with fibrous material (rayon, cotton) for bonding the wire mesh to the tool. The abrasive slurry flows in between the strands of the mesh so that it is evenly distributed while the facing itself takes the exact shape of the tool with its controlled radius, which of course has to take into account the thickness of the wire mesh. 14 claims, 7 illustr. *J* *Pdcb.545*

USP 2,961,356 (Nov 10, 1958) **D. Breese, F. B. Vavrinek, Western Electric Co Inc**

Method of reclaiming diamonds from industrial metal tools

Members of steel and Monel metal from which diamonds embedded therein are to be recovered, are treated with a nitric acid solution heated to at least 100° C, but below boiling point, to dissolve the metal.

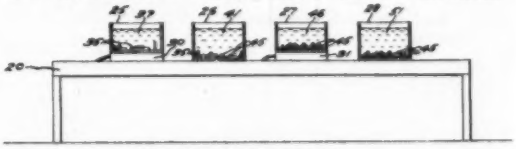


Fig 36. USP 2,961,356.

The recovered diamonds are then cleaned with hydrochloric acid. Fig 36 shows diamond dies undergoing four progressive steps in containers 25, 26, 27, 28. The containers are electrically heated in conventional manner. Dies or tools 35 with diamonds 45 mounted therein in fused powdered metal mountings 36 are placed in a hot nitric acid-water solution 37 in container 25. Container 26 provides a water bath 41, container 27 a hydrochloric acid and water bath 46 kept in a boiling state. Container 28 is placed directly on table 20 with diamonds 45 in a hot water bath 51. 8 claims, 4 illustr. Ref cited : 2 USP.
J *Hwc.1456.545*

USP 2,961,750 (Aug 30, 1957) **H. Bender, Sylvania Electric Prod Inc**

Bonding process

A frusto-conical opening is cut into the end of a metal (copper, steel, copper-steel alloy) shank. A diamond chip is placed in the opening of the upright-held shank after coating the chip with a titanium or zirconium hydride flux. A measured amount of solder, capable of wetting metal and diamond and melting within 600-800° C., is then placed on top of the diamond chip and the assembly fired in an oxygen-free atmosphere to a temp between 850 and 1050° C. The excess metal adjacent

Fig 37. USP 2,961,750.

to the chip is cut away and the chip ground to finish size. Fig 37 shows chip 8 in flux 6 with a piece of solder (silver-copper eutectic alloy, indium-copper-silver alloy "Incosil 15", *etc*) 4 on top in the opening of shank 2. 5 claims, 4 illustr. Ref cited : 8 USP.
J

FP 1,243,893 (Sep 9, 1959) **General Electric Co**
Apparatus for producing high pressures. Dispositif pour la production de pressions élevées

The apparatus is designed to withstand pressures from 150,000 to 400,000 atm. A hydraulic press has two conical punches 1, 2 as shown in Fig 38 within annulus 4 capable of resisting the lateral forces developed when the two punches move towards each other. Rings 11, 12, 13 of certain cross sections composed of electrically

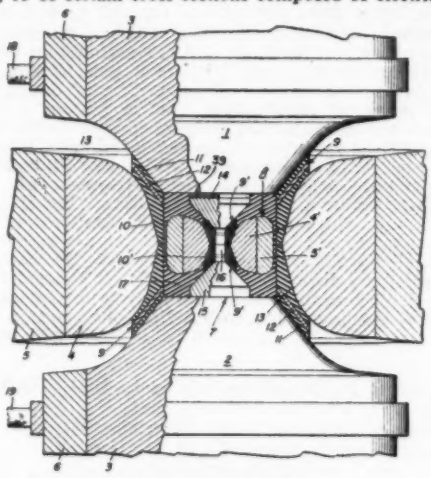


Fig 38. FP 1,243,893.

non-conductive compressible material with steel reinforcements fill the space between the punches and the annulus around chamber 7. This chamber contains additional punches 14, 15 coaxial with 1, 2 moving towards inner annulus 4′ reinforced by 5′. A hydrostatic electrically non-conductive material, remaining flowable under high pressure, (silver chloride, silver sulphate, talc) occupies the enclosed space 17. The reaction takes place in 16. Heating is effected by electric resistance heating through conductors 18, 19. 15 claims, 3 illustr. *J* *Vcb.21.545*

FP 1,243,894 (Sep 9, 1959) **General Electric Co**
Apparatus for producing high pressures at elevated temperatures. Dispositif pour produire des pressions élevées à des températures élevées

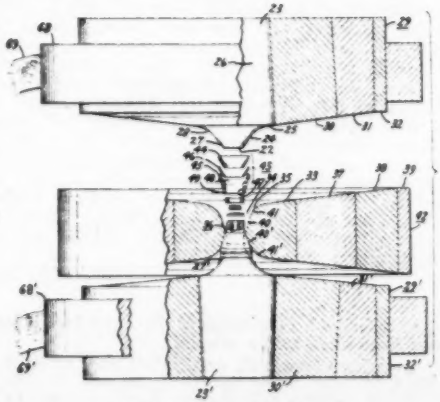


Fig 39. FP 1,243,894.

The apparatus has been developed for withstanding high pressures of 40,000 to 1,000,000 atm at temps of several thousand °C. for long periods. Fig 40 is a cross-section through the reaction chamber formed in a hydraulic press as represented in Fig 39. Punches 23, 23′ with truncated conical ends compress a ring assembly within annulus 33. 52 is the specimen to be subjected to high pressure. It is surrounded by a pyrophyllite

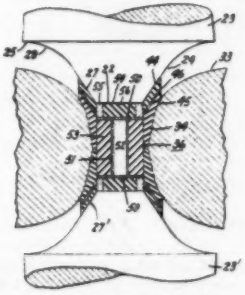


Fig 40. FP 1,243,894.

sleeve 53 placed between disks 56 of heat insulating material within steel rings 55. 44, 45 are also of heat insulating, pressure resisting (ceramic) material. 69, 69′ are electric conductors for heating the sample by an electric current which, in case of an electrically non-conductive sample, passes through metal disks and tube 50, 51. 11 claims, 9 illustr.
J *Vbb Vcb.21.545*

FP 1,243,895 (Sep 9, 1959) **General Electric Co**
Apparatus for producing high pressures at elevated temperatures. Dispositifs pour produire des pressions élevées à des températures élevées

The apparatus is capable of producing temperatures of up to several thousand °C. and pressures of 40,000 to 90,000 atm for long periods. The hydraulic press as shown in Fig 41 is characterized by a double-conical insert 22 surrounded by reinforcing rings with slightly tapering bores over an electrically insulating layer 18. Punch 19, also surrounded by reinforcing rings 20, transmits its downward pressure onto specimen 30, as seen in Fig 42, through member 37. The reaction vessel

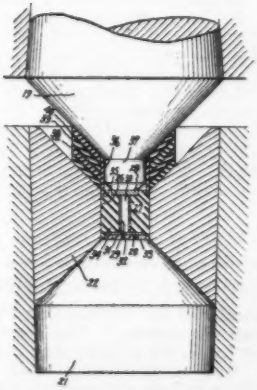


Fig 41. FP 1,243,895.

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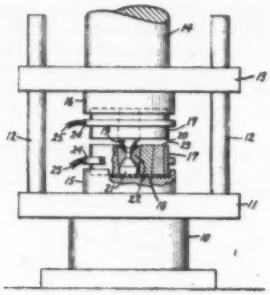

Fig 42. FP 1,243, 895.

is enclosed by an electrically insulating sleeve 34 continued by cylinder 36. Conical parts 38, 39, which are non-conductors of heat and electricity, are made of a substance such as pyrophyllite. 5 claims, 3 illustr.
J *Vbb Vcb.21.545*

PUBLICATIONS RECEIVED

BOOK REVIEWS

Basis of valuation for external cylindrical grinding. Reports of Experiments by the State of North Rhine-Westphalia. Richtwerte für das Aussenrundschleifen. Forschungsberichte des Landes Nordrhein-Westfalen

H. Opitz, H. Frank. Westdeutscher Verlag Köln and Opladen, 1961, 78 pp, illustr, momeographed. Price DM 23.20 (In German)

A report on research into the relation of the depth of roughness of the workpiece, and of grinding wheel wear and life to the most important influences, such as hardness and grit size of the wheel, lubricant, and the conditions of work on the grinder in surface, plunge, and external circumference grinding. The economical range of uses of various grinding wheels and the most favourable conditions are calculated. Further research on external circumference-plunge grinding was concerned with the grindability of 16 Mn Cr 5 and 30 Cr Ni Mo 8 steels. A basis of valuation for external grinding was arrived at from the results of these experiments, and presented in table form. It is claimed that the conditions of work which lead to a given surface quality, economical grinding conditions, and the power needed in grinding can be read off these tables.
B *Chcl.21.52/Chcz.21.52*

DIAMOND TECHNOLOGY

First published 1942 as "Production Methods for Diamond and Gemstone." The second edition of this book by P. Grodzinski has been revised throughout and considerably enlarged. 840 pages, 486 illustrations, 94 tables, and indexes. From NAG Press Ltd., 226 Latymer Court, London W 6. 55s, post free.

The genesis of the diamond. Zur Genesis des Diamanten
H. J. Rodewald. Verlag Meier & Cie, Schaffhausen, Switzerland. 69 pp, illustr.

The book deals with the origin and formation of diamonds, a different aspect of which is discussed in each of the four parts. In Part I, concerning the origin of kimberlitic diamonds, the author puts forward his view that diamonds were formed 'in situ' during the last phase of solidification from a gaseous carbon compound in the magma compressed contripetally and hardened by the surrounding rock walls. Part II deals with the 'artificial diamonds' of W. Prandtl, and the relationship between the aluminothermic and the Moissan methods of diamond synthesis. The Hannay method is analysed in Part III. The final part of the book considers the ideas of W. Hückel, and concludes that, although the thermodynamic relationships between graphite and diamond are still extremely unclear, light can be shed on the problem by studying the analogous case of colourless phosphorous I/red phosphorous.
B *F Hb.52/Fh Ha.52*

Yearbook of Optics and Fine Mechanics 1961. Jahrbuch für Optik und Fein-Mechanik 1961

D. Hacman. Pegasus Verlag, Wetzlar, 1961, 124 pp, appendices illustr. Price DM 4.50. (In German)

The book is divided into three sections, general, optics and mechanics. The general section reviews the history of optics. The optics section is divided into: OI Materials; OII methods of working, tools, and finishing machines; OIV optical instruments; OV optical calculation; OIV technical innovations. Part OII of this section deals with the milling of optical glasses with diamond tools. The mechanics section is made up as follows: MI materials, MII working methods, MIII tools and measuring instruments; MIV machine tools; MV construction parts and elements; MVI calculation; MVII hints for the workshop; MVIII technical innovations; T tables.
B *Vwgf.55/Wwgj.52*

The true book about diamonds

E. Bruton. Frederick Muller Ltd, London, 1961, 144 pp, illustr. Price 8s 6d

A popular book, entirely devoted to the story of the diamond, tells how diamonds were probably formed in ancient volcanoes, and how they reached the present position, whence they are mined. There are stories of the ancient diamond mines of India and Brazil, and an account of the early days of the South African mines, particularly the Big Hole of Kimberley, and the subsequent clash between Cecil Rhodes and Barney Barnato. Histories of the world's most famous diamonds are included. Prospecting and mining methods are described, and also the sorting and polishing of diamonds, and the trading methods employed by the Diamond Corporation. There is a chapter on the diamond in industry, and the synthesis of diamond.
B *F Ha.52/F Hl.52/F.28.52*

American Standard Specifications for Standard Shapes and Sizes of Grinding Wheels

Book: American Standards Association Inc, 10 E 40 St, New York 16, NY. 39 pp, illustr
D *Pe.255.342*

TRADE LITERATURE

Dubbeldee Diamond Company Limited

Dubbeldee Diamond Co Ltd, Lichfield, Staffs. Loose leaf folder, 9¼ × 11 in., illustr

A selection of descriptive pamphlets gives specifications, prices and ordering instructions for the company's range of diamond powders and compounds for lapping and polishing, and of their precision diamond tools (dressers, indenters, cutters, *etc*).

B *N.57*

PATENT LISTS

BRITISH

The Official Journal (Patents) 1961 (3785) (Aug 30)

880,424 JONES & SHIPMAN LTD, A. A. and HOULDSWORTH, J. Grinding machines.

880,048 TEXTRON INC. Edge grinding machine for lenses.

880,089 HEALD MACHINE C. Universal grinding machine.

The Official Journal (Patents) 1961 (3786) (Sep 6)

880,905 SEITZ & CO. Shock-absorbing pivot bearing.

880,709 INOUE, K. Electric spark machining apparatus.

880,983 ROLLS-ROYCE LTD. Electro-erosion.

880,643 NORTON CO. Diamond wheel for cutting hard material.

880,442 ZKL-VYZKUMNY USTAV PRO VALIVA LOZISKA V BRNE. Centreless grinders.

The Official Journal (Patents) 1961 (3787) (Sep 13)

881,164 SYKES LTD, W. E. Machines for grinding gears and similar profiles.

881,167 ATELIERS DE CONSTRUCTION LAVALETTE SA. Electrolytic machining apparatus.

881,059 BRISTOL SIDDELEY ENGINES LTD. Grinding machines for elongated workpieces.

The Official Journal (Patents) 1961 (3789) (Sep 27)

882,606 CARBORUNDUM CO LTD. Abrasive articles.

882,322 UNION CARBIDE CORP. Method and apparatus for thermal rock piercing.

882,539 NATIONAL BROACH & MACHINE CO. Gear finishing.

882,597 NATIONAL BROACH & MACHINE CO. Gear honing machine.

882,576 COMPAGNIE DE SAINT-GOBAIN. Process and apparatus for producing perforations of very small section by spark-erosion.

882,160 COMPAGNIE DE SAINT-GOBAIN. Method of and apparatus for cutting glass sheets.

UNITED STATES

Official Gazette 1961 Vol 769 (1-5) (Aug)

2,994,163 F. L. SCHULZE. Grinding and polishing tool for cylindrical members.

2,994,164 E. T. DALTON, AMERICAN OPTICAL CO. Method and apparatus for simultaneously grinding lenses.

2,994,166 R. F. BARDWELL, R. J. CASSETTARI, AMERICAN OPTICAL CO. Method of making multifocal lenses.

2,994,314 H. E. WAYLAND, W. B. MAYES, TY-SA-MAN-MACHINE CO. Stone cutting apparatus.

2,994,389 F. L. LE BUS, LE BUS ROYALTY CO. Combined drilling and reaming apparatus.

2,994,390 A. B. HILDEBRANDT, JERSEY PRODUCTION RESEARCH CO. Rock bit cutter.

2,994,988 M. B. MENTLEY, D. W. DANIEL, NATIONAL BROACH & MACHINE CO. Gear grinder grinding and incremental feeding means.

2,994,989 B. F. BREGI, NATIONAL BROACH & MACHINE CO. Gear finishing machine employing master gears.

2,994,990 W. WROBBEL, METABOWERK CLASS, RAUCH & SCHNIZLER KG. Grinding and polishing machine.

2,994,991 G. BOTTE. Machine for shaping the rectilinear edge faces of glass sheets by means of a cylindrical grinding drum.

2,994,992 E. A. THOMPSON. Radius grinding machine and spindle.

2,994,993 D. W. JONES, CRANE PACKING CO. Roller construction.

2,994,994 R. F. LONABERGER, SCAN O-MATIC CO. Grinding apparatus and the like.

2,994,995 R. C. GRIFFITH, HEALD MACHINE CO. High-speed wheelhead.

2,995,876 J. E. FRICK, WEBER SHOWCASE & FIXTURE CO INC. Automatic glass edging machine.

2,996,061 H. C. MILLER, SUPER-CUT INC. Abrasive diamond core drill.

2,996,339 E. LORETAN, PARE CHOC SA. Shock-absorbing bearing for movable elements of small mechanisms.

2,996,368 H. W. HERMANCE, BELL TELEPHONE LABORATORIES INC. Abrasive fabrics.

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2,996,602 R. S. WEBB, ELOX CORP. Edm coolant.

2,996,793 T. D. JAYNE, RAND DEVELOPMENT CORP. Tool material.

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2,997,818 E. L. W. JOHANSSON, AB SVENSKA KULLAGERFABRIEKEN. Automatic grinding machine.

2,997,819 E. C. SCHACT, NORTON CO. Abrasive disk.

2,997,820 H. O. SKOOG, AMERICAN EMERY WHEEL WORKS. Organic bond abrasive wheel.

2,997,826 H. E. BOITSCHA, BETTENDORF BAKERY EQUIPMENT CO. Bread slicing machine sharpening means.

2,997,827 J. W. GIFFEN, CORNING GLASS WORKS. Precision grinding.

2,998,000 C. L. W. JOHANSSON, AB SVENSKA KULLAGERFABRIEKEN. Device for performing an automatic grinding operation.

2,998,365 J. F. H. CUSTERS, H. B. DYER, R. W. DITCHBURN, INDUSTRIAL DISTRIBUTORS. Treatment of diamonds.

SOUTH AFRICAN

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61/1255 B. R. GENBERG, J. A. HJÄLSTEN, C. O. LINDGREN, ATLAS COPCO AB, NACKA & SANDVIKENS JERNWERKS AB. Apparatus for drilling in earth-covered rock.

61/1512 C. W. MOSSBERG, COLD POINT LTD. Drill.

60/2977 J. F. H. CUSTERS, H. B. DYER, B. W. SENIOR, P. T. WEDEPOHL, ADAMANT LABORATORIES (PTY) LTD. Synthesis of diamonds.

AUSTRALIAN

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234,353 NV PHILIPS' GLOEILAMPENFABRIEKEN. Method of brazing on diamonds.

234,553 PLASTIC CONTACT LENS CO. Finishing contact lenses.

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356,049 E. MOCHE, R. POPPE, VEB FEINMESS DRESDEN. Engraving apparatus for circles.

356,090 P. -E. BOURQUISS, C. SCHLATTER, SEITZ & CO. Axial thrust bearing.

356,284 A. COLOMB. Needle for gramophone.

356,367 H. HUBER. Abrasive tool.

FRENCH

Bulletin Officiel 1961 Vol 2 (34-38) (Aug-Sep)

1,266,407 H. WOHLENBERG, KOMMANDITGESELLSCHAFT. Device for the control of a lathe tool.

1,266,582 M. BRUMA, CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE. Electrodes for the machining by intermittent electric discharges.

1,270,164 ANOCUT ENGNG CO, L. A. WILLIAMS. Electrolytic grinding.

1,270,999 NV PHILIPS' GLOEILAMPENFABRIEKEN. Method of subdividing hard bodies by cutting or sawing in order to obtain separate parts.

1,270,844 NV PHILIPS' GLOEILAMPENFABRIEKEN. Method for manufacturing crystals in the form of rods of semi-conductive material.

1,271,310 V. N. BARKE, N. I. BLITSTEIN, I. M. GRIAZNOV, A. L. LIVCHITS, B. K. METCHETNER, S. S. PODLAZOV, D. F. YAKHIMOVITCH. Machine for ultrasonic machining.

1,271,143 SA CIE DE SAINT-GOBAIN. Machine for cutting sheets of glass.

1,271,364 L. M. ERICSSON, TELEFON AB. Hardness tester.

1,271,621 A. PARIOT, SA DIACARB. Cutting tool.

1,272,339 D. W. DANIEL, NATIONAL BROACH & MACHINE CO. Method and device for finishing gear wheels.

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Applications Open to Public Inspection

1,110,781 F. W. NEUMANN, SIEMENS-SCHUCKERTWERKE AG. A.C. electro-erosion machine with automatic power limit.

1,113,158 O. POSCH, MASCHINENFABRIK GEHRING KG. Device for visually indicating the feed of a honing stone and its wear.

1,113,387 E. HOYET, E. J. HAZEN, PITTSBURGH PLATE GLASS CORP. Method of securing abrasive elements on carrier plates of tools for grinding sheets of glass.

1,113,388 G. F. KEELERIC, L. A. WILLIAMS, BOART PRODUCTS SOUTH AFRICA LTD. Device for truing a grinding tool.

1,113,390 W. B. SCHUTZE, A. SCHUTZE, O. H. SCHUTZE. Method of grinding workpieces.

1,104,107 E. F. KATZKE, CRANE PACKING CO. Device for lapping annular surfaces on the flanges of workpieces.

1,114,109 K. HACK. Device for the automatic truing of two co-operating grinding wheels of a spring end grinding machine.

1,114,110 F. SCHIEVENEDEL, DEUTSCHE EDELSTAHLWERKE AG. Device for the automatic feeding of a lapping, polishing or abrasive material.

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975,182 G. ERVIN jun, DEUTSCHE NORTON GmbH. Method of making silicon carbide grinding bodies.

975,248 R. WESTENBERGER, MSO SCHLEIFMASCHINEN- UND SCHLEIFMITTELWERKE AG. Feed movement for grinding machines, in particular those operating as plunge cut grinders.

AUSTRIAN

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217,140 NV PHILIPS' GLOEILAMPENFABRIEKEN. Spark erosion machine.

217,338 F. UNGERER. Circular grinding machine for rolls.

217,362 A. STIHL. Endless stone saw chain for motor chain saws.

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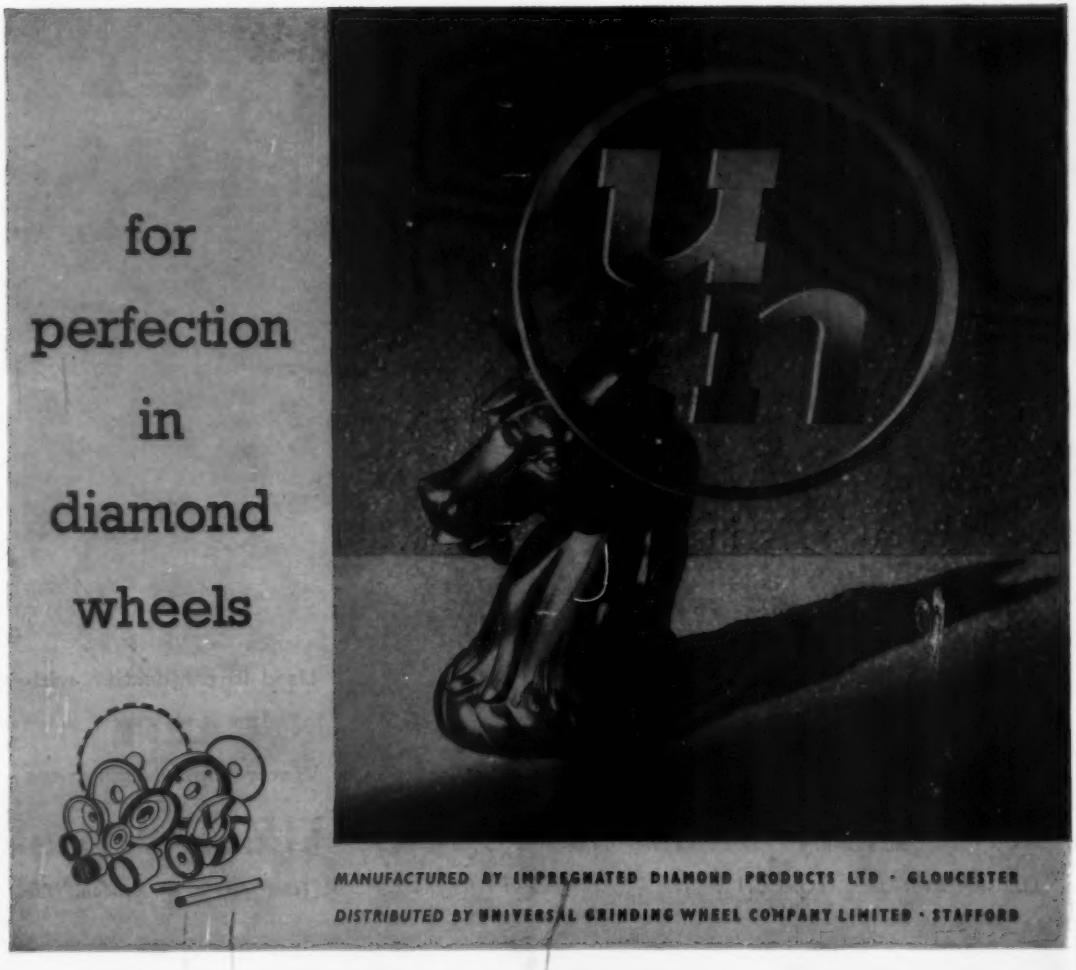
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